Government of the People's Republic of Bangladesh
Bangladesh Water Development Board (BWDB)

Coastal Embankment Improvement Project Phase-2 (CEIP-2)

Consultancy Services for Feasibility Studies and Preparation of Detailed Design for the Following Phase (CEIP-2)

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)
DRAFT

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Royal HaskoningDHV
Enhancing Society Together

nhc
northwest hydraulic consultants

DEVELOPMENT DESIGN CONSULTANTS LIMITED

KMC Ltd
Working for safe living

EXECUTIVE SUMMARY

Introduction

Bangladesh is a hydraulic civilization situated at the confluence of three great trans Himalayan rivers— the Ganges, the Brahmaputra (or Jamuna), and the Meghna (GBM). The GBM river system marks both the physiography of the nation, as well as the culture and livelihood of the people. While over 90 percent of the GBM catchment lies outside of Bangladesh, approximately 200 rivers and tributaries of the GBM drain through the country via a constantly changing network of estuaries, tidal inlets, and tidal creeks before emptying into the Bay of Bengal1. Thus, the coastal zone of Bangladesh, the lowest land mass in the country, is continually influenced by these Himalayan drainage ecosystems.

The Government of Bangladesh planned to develop a safe and inhabitable coastal zone. GoB constructed embankments and polders surrounding the coastal area to continue the commitment. The main purpose was to protect from tidal flooding. The embankments and polders were designed to protect against high tides, but the effect of storm surges was neglected then. Breaching of embankments caused waterlogging inside the polders, and poor maintenance caused internal drainage congestion and heavy external siltation—all of these results in salinity intrusion in the polders. As a result, the embankments were substantially damaged, and the integrity of polders was threatened.

Coastal Embankment Improvement Project–Phase 1 (CEIP-I) was initiated with a long-term objective to increase the resilience of the entire coastal population to tidal flooding and natural disasters by upgrading the whole embankment system. With an existing network of the embankment nearly 6,000 km long with 139 polders, the magnitude of such a project was enormous. So in the first phase, 17 polders were selected for the next phase of CEIP (CEIP-2) using the the multi-criteria analysis method, and the development interventions were undertaken. With the continuation of the CEIP-I, CEIP-2 has been proposed for the next batch of 15[1] chosen polders.

Environmental and Social Management Framework (ESMF)

The proposed interventions of the CEIP-2 project will significantly impact the natural environment and the people living in that area. Proper environmental and social assessment and ecological and social management plan (ESMP) are essential to address the project's impacts. This Environmental and Social Management Framework (ESMF) has been developed to ensure that neither the project activities (both in terms of needs and quality) nor the environment is compromised through the program intervention.

The ESMF presents possible impacts of the CEIP-2, mitigation, enhancement, contingency and compensation measures, environmental management and monitoring plan, and institutional framework, including inter-agency cooperation for implementing EMP. The EMF will facilitate compliance with the World Bank's environmental safeguard policies and the Government of Bangladesh's policies, acts, and rules.

Project Description

The CEIP-2 project will consist of specific interventions for improving the embankment named as polders which are explained below: the project will support five major components:

Component A – Rehabilitation and Improvement of Polders

[1] When preparing this report, 15 new polders were still considered

Component B: Implementation of Social Action and Environmental Management Plan are expected to have direct environmental and social impacts.

Component C- Supervision and Monitoring and Evaluation of Project Impact

Component D – Project Management, Technical Assistance, Training, and Strategic Studies may qualitatively facilitate ESMF implementation monitoring and environmental capacity building.

Component E – Contingent Emergency Response. The environmental screening will be included if the project requires any polder rehabilitation due to any natural disaster.

Policies, Legal and Administrative Framework

A wide range of laws and regulations like the Environment Conservation Act, 1995 (ECA, 1995) and the Environment Conservation Rules (ECR, 1997) related to environmental issues relevant to this project have been reviewed. Under the Environmental Conservation Rules (1997), a classification system was established for development projects and industries based on the project objective. These categories are Green, Orange A, Orange B, and Red. The construction/reconstruction/expansion of flood control embankment, polder, etc., is categorized as Red in accordance with DOE's classification. For the 'Red' category, it is mandatory to carry out an Environmental and Social Impact Assessment (ESIA), including an Environmental Management Plan (EMP), and develop a Resettlement Plan to get environmental clearance from DoE. According to the World Bank requirement, the project has been classified as "Category A," considering the risk associated with widely involved major civil works by reconstruction and rehabilitation of the coastal embankment to protect against tidal flooding and storm surges. Since the coastal area is populated and used for cultivation widely, certain negative environmental impacts may occur during the implementation and operational phase of the overall polder system.

Potential Impacts

The potential impacts of the CEIP-2 on the key environmental and social parameters identified as part of the ESMF have also been analyzed according to the ESS1 risk categories based on the significance of each impact. The impacts have been placed in three phases as follows-

<u>Project Preparation Phase</u>

- Site-Specific Land Cover and Land Use Changes (ESS 1, 3, 6)
- Loss of trees (ESS 6)
- Loss of aquatic habitat (ESS 1, 3, 6)
- Drainage congestion and waterlogging (ESS 1, 3, 4)
- Impacts on Vulnerable and disadvantaged groups/communities/individuals (ESS1)

<u>Project Implementation Phase</u>

- Air Pollution (ESS 1, 3, 4, 6)
- Noise Pollution (ESS 1, 3, 6)
- Water Pollution (ESS 1, 3, 4, 6)
- Soil Contamination (ESS 1, 3, 4, 6)
- Waste generation (ESS 1, 3, 4, 6,8)
- Impacts on aquatic habitat (ESS 1, 3, 6)
- Site Clearance and Restoration (ESS 1, 2, 4, 6)
- Occupational Health and Safety (ESS 1, 2, 4)
- Impacts on Livelihoods and Income (ESS 1)
- Involuntary Resettlement Impacts (ESS 5)

- Effects on Indigenous People (ESS 7)
- Impact on Cultural Heritage (ESS8)

Post-Project Operational Phase

- Potential Changes in Water Courses (Canal) (ESS 1, 3, 6)
- Loss of Ecological Connectivity (ESS 1, 6)
- Loss of Vegetation (ESS1, 6)
- Generation of Solid Waste (ESS 1, 3, 4)
- Air Pollution (ESS 1, 3, 4)
- Noise Generation (ESS 1, 3, 4, 8)
- Water Pollution (ESS 1, 3, 6)
- Impacts on Local Livelihoods (ESS 1, 2)

Mitigation Measures

The ESMF considers the analysis of the overall coastal polder and should be considered for guidance purposes. Still, the exact study area for different environmental attributes (water, air, noise, soil, etc.) is to be submitted considering the proposed activities and location, alignment, and proper reasoning, for identifying the exact impact and related mitigation measures. The project influence area will be selected accordingly.

Environmental and Social Management

CEIP-2 will use a structured environmental and social management approach to allow the project development following the newly developed 10 ESSs, following the mitigation hierarchy of avoidance, minimization, mitigation, and compensation/offset for negative impacts, and enhancement of positive impacts was practically feasible. The following sections describe what needs to be done at each stage of the project life – sub-projects implementation, project activities implementation, and progress reporting.

Institutional Arrangement

The contractor is responsible for the implementation of ESMP during construction works. The Project Supervision Consultant is primarily responsible for supervising the implementation of the ESMP. BWDB will conduct field inspections and surveys by the environment specialists (to be employed by BWDB regularly). M&E consultant will be responsible for independent monitoring and implementation of ESMP and external monitoring and evaluation. DoE will be consulted if complicated issues arise during the construction and operation stages. BWDB will apply for annual site clearance from DoE. WMO's will be trained to ensure environmental management during project operation. The environmental Management Unit of BWDB, strengthened through this project, will ensure and oversee the environmental management during project operation.

Public Consultation & Disclosure Requirement

For all Category A (e.g., CEIP project) projects, the borrower should consult the project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental aspects and takes their views into account. The borrower should initiate such consultations as early as possible. For Category A projects, the borrower should consult these groups at least twice: (a) shortly after environmental and social screening and before the terms of reference for the ESMF or ESIA are finalized, and (b) once a draft ESMF or ESIA report is prepared. In addition, the borrower should consult with such groups throughout project implementation as necessary to address ESIA-related issues that affect them.

During ESMF preparation, 41 consultation workshops have been carried out. Although this ESMF will be the guiding framework for taking care of environmental concerns of the CEIP-2 and has been consulted before preparing, it may be required to update in the future to comply with the policy, legal or institutional changes.

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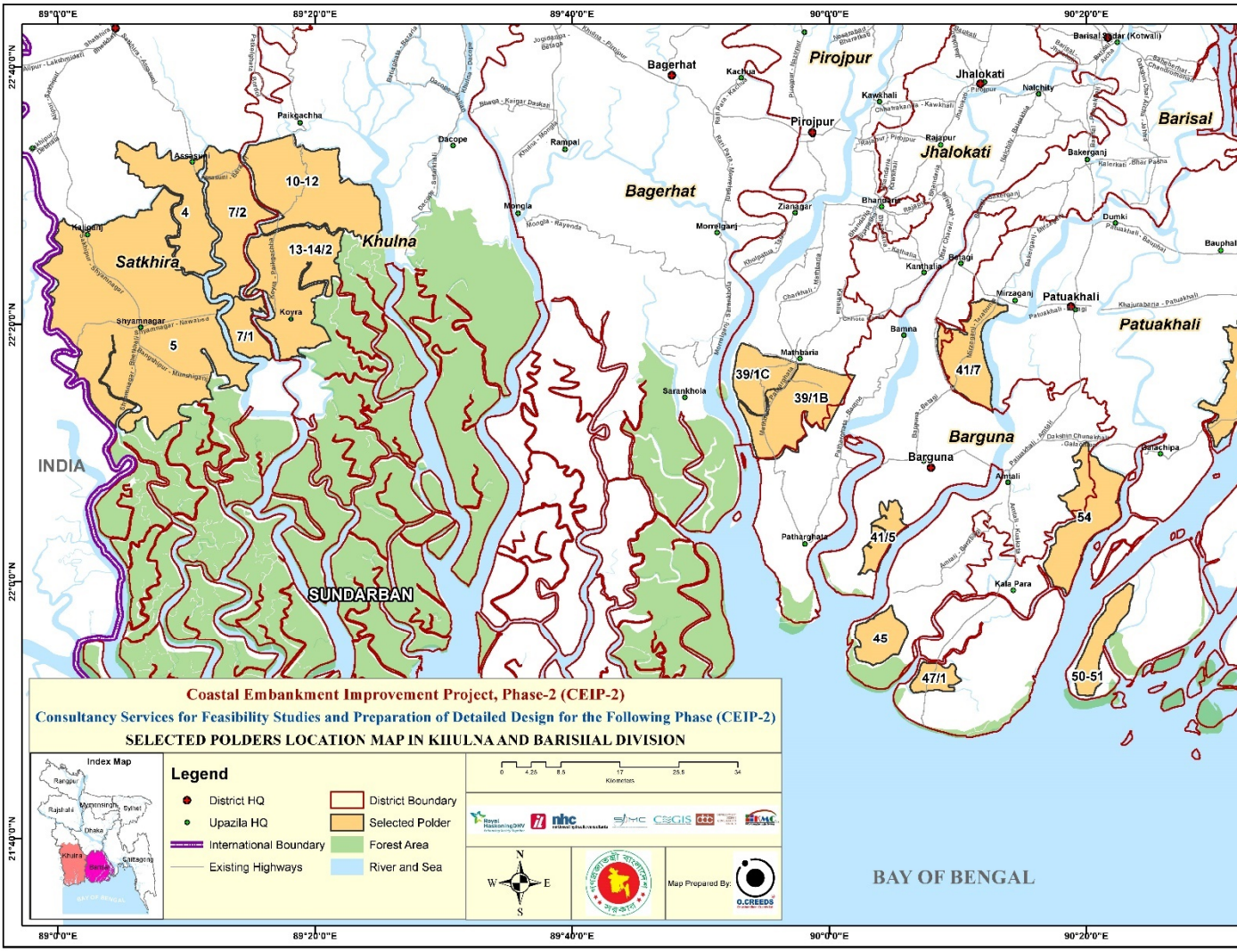

Abbreviations, acronyms

ADB	Asian Development Bank
AIDB	Asian Infrastructure Development Bank
AIIB	Asian Infrastructure Investment Bank
AP	Affected Person
ARAP	Abbreviated Resettlement Action Plan
ARIPA	Acquisition and Requisition of Immovable Property Act
ASA	Advisory Services and Analytics
BBS	Bangladesh Bureau of Statistics
BDT	Bangladeshi Taka
BEF	Bangladesh Employers Federation
BMP's	Best Management Practices
BN	Bangladesh Navy
BOD	Biological Oxygen Demand
BP	Bank Policy
BP	Bank Procedures
BSEC	Bangladesh Steel & Engineering Corporation
BWDB	Bangladesh Water Development Board
CBO	Community Based Organization
CC	Climate Change
CCB	Climate Co-Benefits
CCL	Cash Compensation under Law
CE	Citizen Engagement
CEAP	Construction Environmental Action Plan
CG	Coast Guard
CIIA	Cumulative and Induced Impact Assessment
CNGO	Coordinating Non-Governmental Organization
COD	Chemical Oxygen Demand
CPF	Country Partnership Framework
CPR	Common Property Resources
CSO	Civil Society Organizations
DA	Designated Account
DAE	Department of Agriculture Extension
DCRO	Deputy Chief Resettlement Officer
DDR	Due Diligence Report
DIA	Designated Implementing Agency
DIFE	Department of Inspection for Factories and Establishments
DoE	Directorate of Employment
DoF	Department of Fisheries
DPCC	District Project Coordination Committee
DPD	Deputy Project Director
DPs	Development Partners
EA	Environmental Assessment
ECA	Ecological Critical Area
ECA	Environmental Conservation Act
ECC	Environmental Clearance Certificate
ECoP's	Environmental Code of Practices
ECR	Environment Conservation Rules
EHS	Environmental, Health, and Safety
EIA	Environmental Impact Assessment

EMF	Environmental Management Framework
EMIS	Environmental Management Information System
EMP	Environmental Management Plan
EMU	Environment Management Unit
ERP	Emergency Response Plan
ES	Environmental Screening
ESA	Environmental and Social Assessment
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESR	Environmental Screening Report
ESS	Environmental and Social Standards
FAA	Flood affected area
FAO	Food and Agriculture Organization
FAP	Flood Action Plan
FGAP	Framework for Gender Action Plan
FGD	Focus Group Discussion
FM	Financial Management
FPIC	Free, Prior and Informed Consent
GAP	Gender Action Plan
GBV	Gender-Based Violence
GDP	Gross Domestic Products
GDR	General Department of Resettlement
GMB	Ganges, Brahmaputra, and Meghna
GoB	Government of Bangladesh
GRC	Grievance Redress Committee
GM	Grievance Mechanism
GRS	Grievance Redress Service
ha	Hectare
HH	Household
HIES	Household Income and Expenditure Survey
IA	Information Access
IDA	International Development Association
IE	Impact Evaluation
IEE	Initial Environmental Examination
IFC	International Finance Corporation
ILO	International Labor Organization
IoL	Inventory of Loss
IP	Indigenous Peoples
IRR	Internal Rate of Return
LAO	Land Acquisition Officer
LAP	Land Acquisition Plan
LFS	Labor Force Survey
LGED	Local Government Engineering Department
LGI	Local Government Institution
LMIC	Lower-Middle Income Country
LMP	Labour Management Procedures
LMS	Land Market Survey
LRSP	Livelihood Restoration Support Plan

M&E	Monitoring and Evaluation
MCS	Monitoring, Control, and Surveillance
MEF	Ministry of Economy and Finance
MIS	Management Information System
MoEFCC	Ministry of Environment, Forest and Climate Change
MoEWOE	Ministry of Expatriate Welfare and Overseas Employment
MoF	Ministry of Finance
MoFL	Ministry of Fisheries and Livestock
MoHA	Ministry of Home Affairs
MoHFW	Ministry of Health and Family Welfare
MoI	Ministry of Industry
MoLE	Ministry of Labor and Employment
MoLGRD&C	Ministry of Local Government, Rural Development and Co-operatives
MoU	Memorandum of Understanding
MPA	Multi-Phased Approach
MT	Metric Tonne
NARI	Northern Areas Reduction of Poverty Initiative
NATP	National Agricultural Technology Project
NGO	Non-Government Organization
NM	Non-Motorized
NOC	No Objection Certificate
NRS	National Resettlement Specialist
NSDA	National Skills Development Authority
NSDP	National Skills Development Policy
O&M	Operation and maintenance
OHS	Occupational Health and Safety
OHSC	Occupational health and Safety Circle/Cell
OHSM	Occupational health and safety management
OP	Operational Policy
PA	Protected Area
PAD	Project Appraisal Document
PAH	Project Affected Households
PAP's	Project Affected Persons
PAU	Project Affected Unit
PAVC	Property Assessment and Valuation Committee
PBPA	Performance-Based Partnership Agreements
PCU	Program Coordination Unit
PD	Project Director
PDO	Project Development Objective
PIB	Public Information Brochure
PIC	Project Implementation Committee
PIU	Project Implementation Unit
PMIS	Project Management Information System
PMU	Project Management Unit
PPE	Personnel Protective Equipment
PPP	Public and Private Partnership
PPR	Project Progress Report
PPSD	Project Procurement Strategy for Development
PRA	Participatory Rural Appraisal
PRIDE	Private Investment and Digital Entrepreneurship
PSC	Project steering committee

PVAC	Property Valuation Advisory Committee
PWD	People with Disabilities
R&D	Research and Development
RAC	Resettlement Advisory Committee
RAP	Resettlement Action Plan
RCS	Replacement Cost Study
RHD	Roads and Highways Department
RPF	Resettlement Policy Framework
RV	Replacement Value
SA	Social Assessment
SAE	Sub Assistant Engineer
SDE	Sub Divisional Engineer
SDG	Sustainable Development Goals
SDP	Skills Development Plans
SEA	Strategic Environmental Assessment
SEC	Small Ethnic Community
SECDP	Small Ethnic Community Development Plan
SECI	Social and Environmental Circle
SEMVPP	Small and Ethnic Minorities, Vulnerable Peoples Plan
SEP	Stakeholders Engagement Plan
SES	Socio-economic survey
SIA	Social Impact Assessment
SIMP	Social Impact Management Plan
SMF	Social Management Framework
SMP	Social Management Plan
TDP	Tribal People Development Plan
TMIS	Training Management Information System
ToC	Table of Contents
ToR	Terms of Reference
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Conference on Law of the Sea
UPCC	Upazila Project Coordination Committee
USD	United States Dollar
WB	World Bank
WBG	World Bank Group

1. INTRODUCTION

1.1 Background of the Project

Bangladesh is a hydraulic civilization situated at the confluence of three great trans- Himalayan rivers—the Ganges, the Brahmaputra (or Jamuna), and the Meghna (GBM). The GBM river system marks both the physiography of the nation, as well as the culture and livelihood of the people. While over 90 percent of the GBM catchment lies outside of Bangladesh, approximately 200 rivers and tributaries of the GBM drain through the country via a constantly changing network of estuaries, tidal inlets, and tidal creeks before emptying into the Bay of Bengal. Thus, the coastal zone of Bangladesh, the lowest landmass in the country, is continually influenced by these Himalayan drainage ecosystems.

Bangladesh's physical and cultural characteristics, and the livelihoods of its people, are defined by the GBM delta, which is endowed with an abundance of natural resources. Bangladesh's dynamically evolving coastal landscape is controlled by the delta's underlying geology and topography and the dynamic interaction between the influx of water and sediment, the coastal processes such as tides and wave action, and episodic events such as cyclones and monsoons. The strength of the tides and the flatness of the delta causes the tides to influence river processes a long way upstream in the southern estuaries. Sixty-two percent of the coastal land has an elevation of up to 3 m above mean sea level, which rises to eighty-three percent having a height of up to 5 m above mean sea level.

Coastal zone 04 spans over 710 km of coastline and is prone to multiple threats. The zone constitutes 32 percent of the land area and hosts nearly 28 percent of the population (i.e., 42 million7). Being home to around 46 million people (29% of the total population), the Coastal Zone is predominantly used for agriculture (more than 30% of the cultivable land in Bangladesh is in the coastal area and other activities such as shrimp and fish farming, forestry, tourism, salt production, ship-breaking yards, ports, and other industries. However, these growing opportunities come with risks, as the coastal zone is well-known for its vulnerability to coastal hazards.

Bangladesh is considered one of the most disaster-prone and climate-vulnerable countries globally. The coastal zone is unceasingly influenced by river system fluctuations and coastal processes such as tidal propagation and salinity intrusion coastal threats such as cyclone events. Cyclones pose a major threat to coastal communities, causing inundation of the coastal land from the high storm surges generated and accompanied by powerful winds. In addition, slow-moving chronic stressors such as erosion, salinity intrusion, and waterlogging are presented frequently and extensively in the coastal zone, severely impacting livelihoods and the environment. These chronic stressors can result in loss of land, infrastructure failure, difficulties in operating the polder drainage systems, and reduced agricultural productivity.

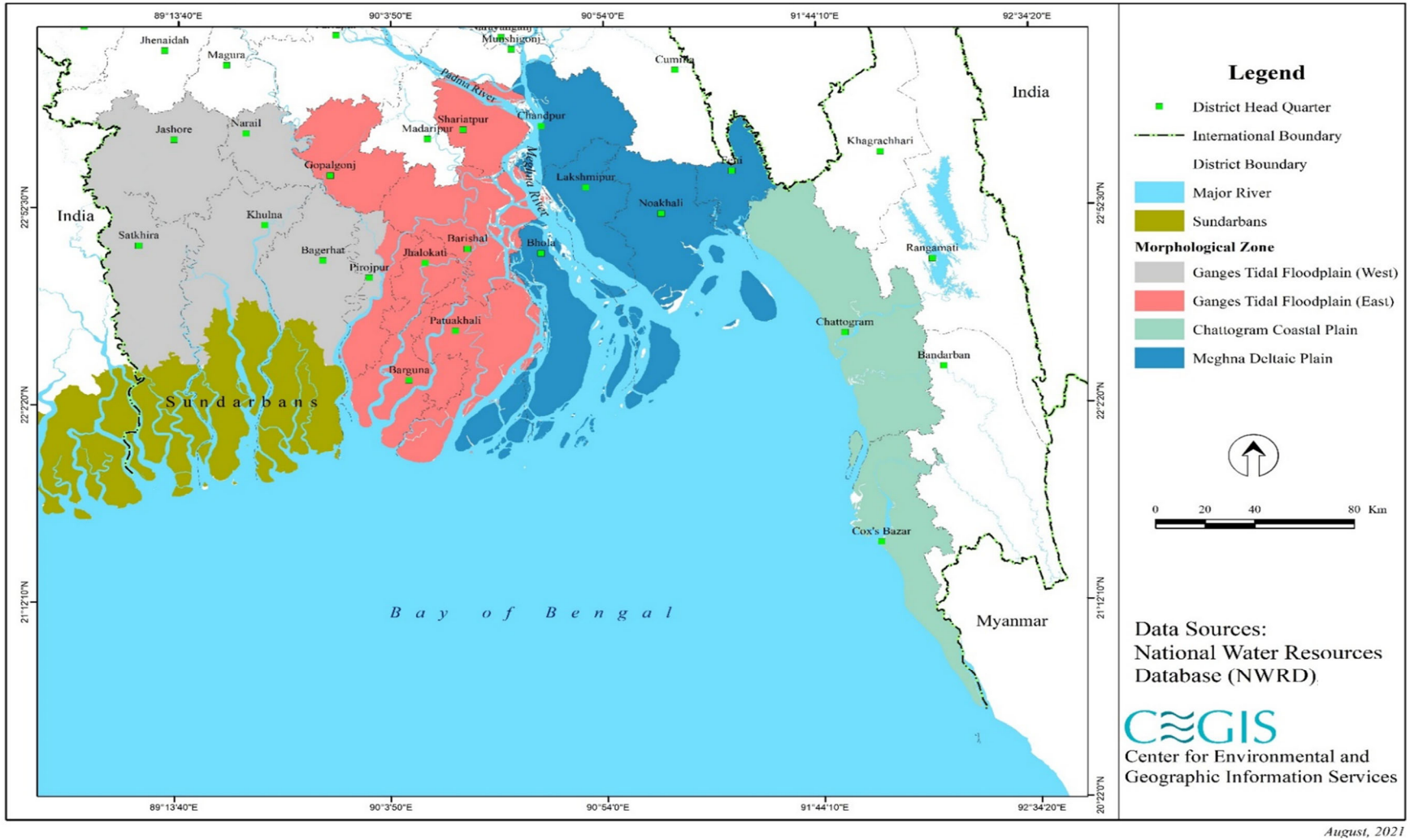

Figure 1-1: Coastal zone of Bangladesh (Source- CEIP-1)

Over the past decades, the Government of Bangladesh has been making multiple attempts to reduce risk and save lives, reduce economic losses, and protect development gains. Since the early 1960s, the Government of Bangladesh has been constructing Polders along the entire coastal belt to protect the people and crops from tidal inundation and saline water intrusion and recover a large extent of land for permanent agriculture. A Polder can be defined as "is a low-lying tract of land enclosed by embankments known as dykes that form an independent hydrological entity which has no physical connection with outside water other than through manually operated devices (water control structures)." Polders' existence prevents saline water from entering the agricultural fields, thereby boosting farm productivity and providing food security for the millions of people living in the Polder areas. In addition, the Polders protect against frequent tidal flooding, thereby preventing damage to people and crops and stimulating economic development for the local Polder communities. Polders are, in addition, equipped with Drainage and Flushing Sluices to control the water inside the embanked area.

Nowadays, some 139 Polders are present across the coastal zone, covering an area of 1.2 million ha (25% of the coastal zone). The total length of the embankments running along the Polders is approximately 5,665 km. The total number of regulators is about 1,697. The total number of flushing inlets is around 1,202. The total length of drainage channels is approximately 5,707 km; existing embankment crest levels typically protect the 5 to 10-year storm surge return period only (2% wave overtopping level).

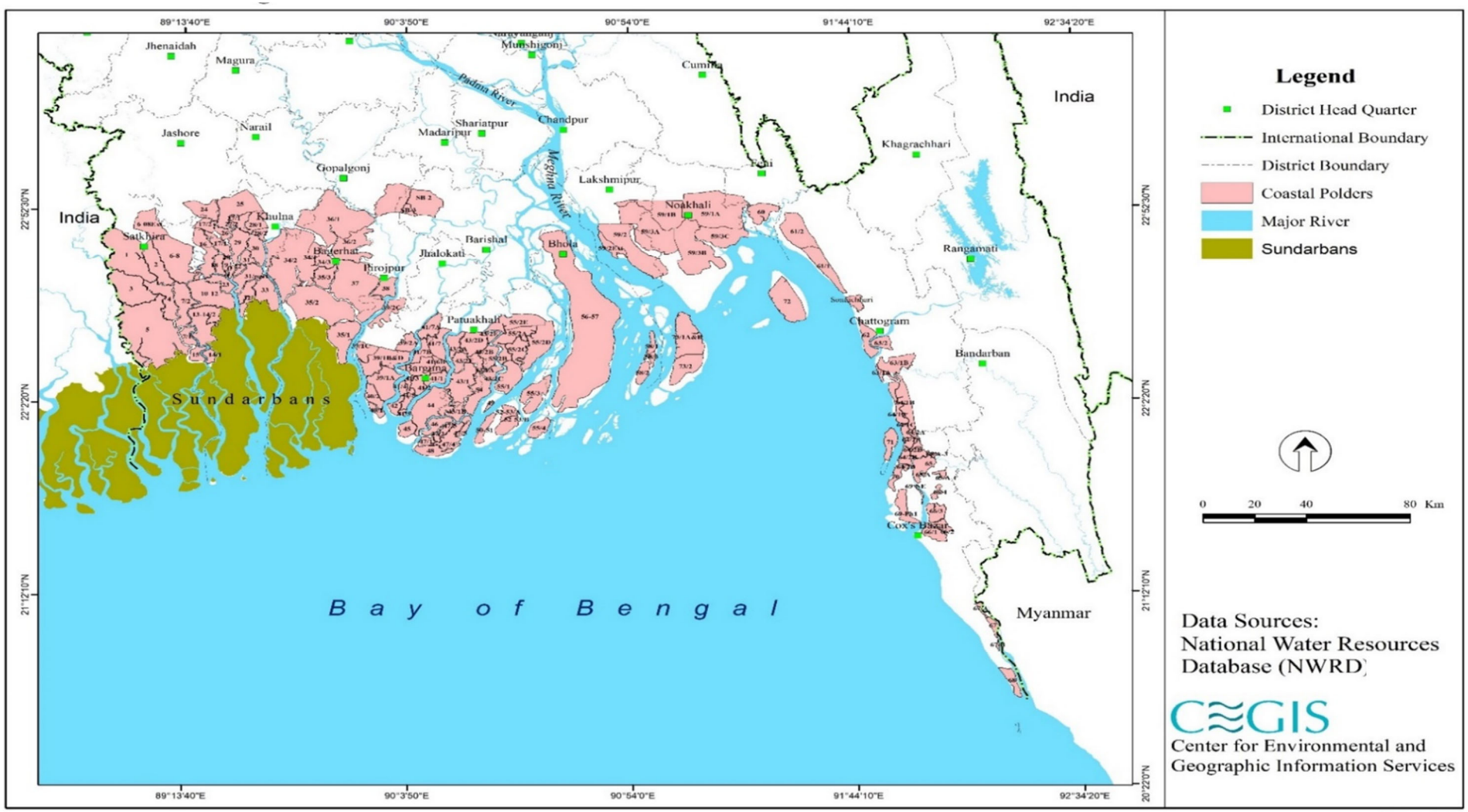

Figure 1-2: Coastal Polders Bangladesh (Source- CEIP-1)

Poor maintenance and inadequate management of the polders have also contributed to internal drainage congestion and heavy external siltation. As a result, soil fertility and good agriculture production decline because waterlogging and salinity increase inside polders.

In recent years, the following cyclones struck the coast of Bangladesh: SIDR in November 2007, Aila in May 2009, and Amphan in May 2020. The number and severity of cyclones in Bangladesh and the associated mortalities have varied greatly during the past 50 years. The two deadliest cyclones occurred in 1970 and 1991, with > 500,000 and almost 140,000 deaths. Bangladesh has made outstanding progress during the past 50 years, reducing deaths and injuries from cyclones, leading to an approximately 100-fold reduction.

All the above reasons have led the Government to refocus its strategy on the coastal area from one that only protects against high tides to one that protects against frequent storm surges. The Government has recognized the need for a systematic approach to upgrade the coastal embankment system to protect against an appropriate return period and be based on sound local risk and vulnerability assessment. Moreover, the embankment program needs to be accompanied by an afforestation program, particularly on the seaside, as forestation has been shown to reduce storm surge damages significantly.

1.2 Project Description

1.2.1 Proposed CEIP-2 Project

The Coastal Embankment Improvement Project Phase-1 (CEIP-1), implemented by the Bangladesh Water Development Board (BWDB) and funded by the World Bank (WB), safeguards the Coastal Zone of Bangladesh against flooding due to storm surges and cyclones, combats erosion and enhances the coastal resilience. Next, that project's objectives are to reduce the loss of assets, crops, and livestock during natural disasters, reduce the time of recovery after natural disasters, improve agricultural production by reducing saline water intrusion, which is expected to worsen due to climate change and improve the Government of Bangladesh's capacity to respond promptly and effectively to a natural disaster. The long-term objective of CEIP is to increase the resilience of the entire coastal population to tidal flooding and natural disasters by upgrading the whole embankment coastal polders. With an existing network of the embankment of nearly 6,000 km long with 139 polders, the magnitude of such a project is enormous. Hence, a multi-phased approach has been adopted over 15 to 20 years. The proposed Coastal Embankment Improvement Project –Phase 1 (or CEIP-I) is the first phase of this long-term program. Developing a Multi-Criteria Analysis (MCA) (e.g., physical condition of the embankment and the drainage system, economic activities in the polders, population and socio-economic conditions, environmental condition, and economic efficiency) 17 polders were selected in the first phase of CEIP-I.

Of the 139 polders along the Bangladesh coast, 17 polders have been included in the defined Packages 1, 2, and 3 of the CEIP-1 program. Currently, only ten polders of Packages 1 & 2 are being implemented, and the seven remaining polders of the envisaged Package 3. For the above view, 122 polders were potentially be considered for inclusion in CEIP-2. However, some of these 122 polders will never be eligible for CEIP-2 because it concerns locations where threats are relatively limited and remote in terms of logistic constructability. And polders are less vulnerable because their condition or socio-economic developments cannot justify investments in polder improvements.

Furthermore, certain polders will be improved by other Government budgets or other donors. After the detailed prioritization and the Multi-Criteria Analysis (MCA), 15[1] polders have been

chosen out of 23 for detailed feasibility study and design and Environmental and Social Impact Assessment. Out of 122 polders, 23 polders have been quickly selected without elaborating in detail based on various reasons.

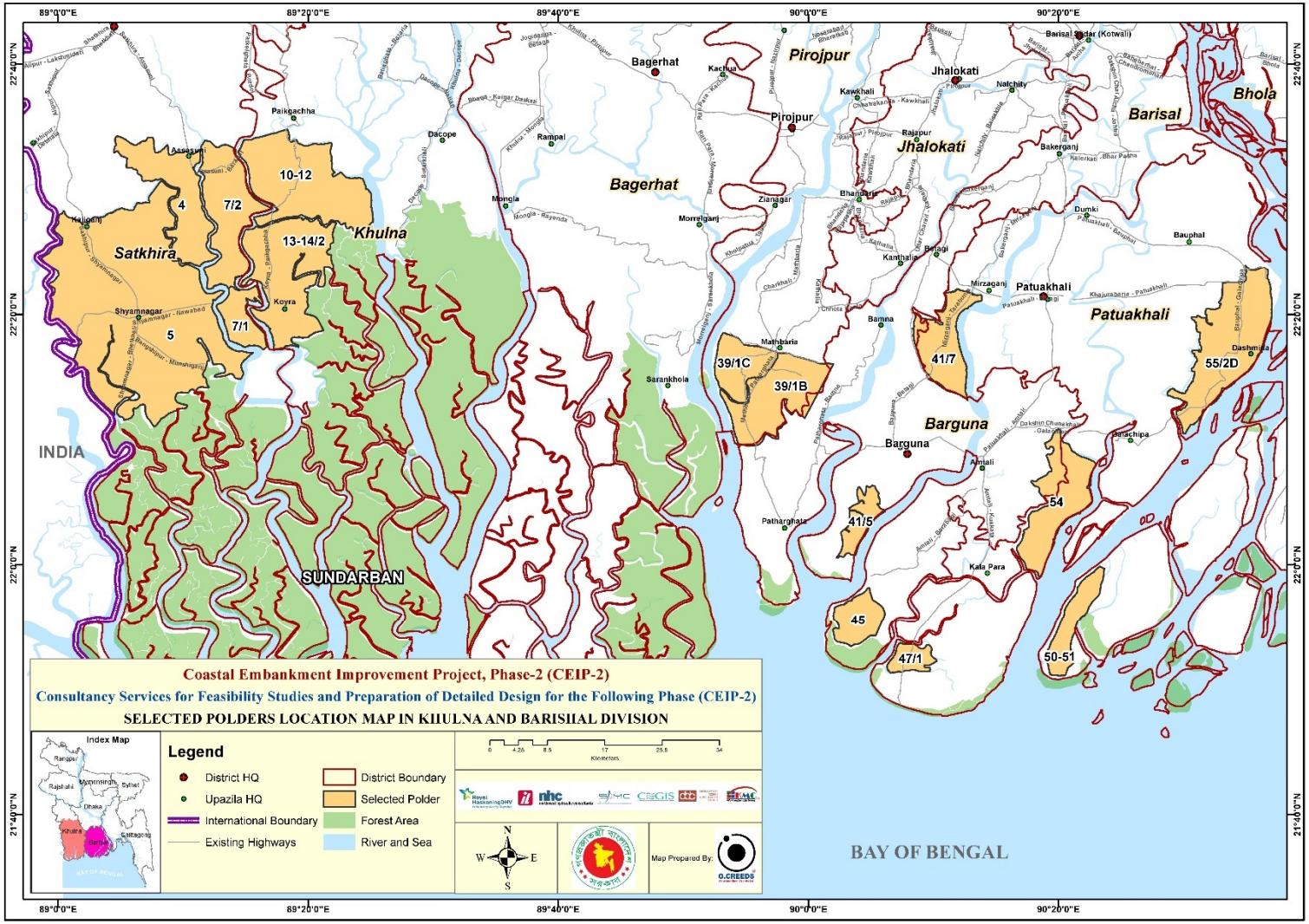

Figure 1-3: Project Intervention Area (Source- O.CREEDS Ltd.)

1.2.2 Proposed Interventions of CEIP-2 with Possible Environmental Concerns

The CEIP-2 project will consist of specific interventions for improving the embankment named as polders which are explained below: the project will support five major components. Component A – Rehabilitation and Improvement of Polders and Component B: Implementation of Social Action and Environmental Management Plan are expected to have direct environmental and social impacts. Component C- Supervision and Monitoring and Evaluation of Project Impact and Component D – Project Management, Technical Assistance, Training, and Strategic Studies may qualitatively facilitate ESMF implementation monitoring and environmental capacity building. No fund has been allocated now for Component E – Contingent Emergency Response. The environmental screening will be included if the project requires any polder rehabilitation due to any natural disaster.

a) **Embankment raising/repairing breaching points:** Most of the embankments of coastal polders were constructed many years back and have subsided naturally. Therefore, the existing crest level is reduced from the design level. Also, some parts of the embankments were breached due to tidal/ storm surges during the cyclone. Therefore, almost all embankments need to be raised, and the breaching point should be repaired considering the present and future tidal/ storm surge level scenarios. This will be one of the major interventions under the CEIP-2 project. This intervention will include mainly earthworks. Within the framework of CEIP-2, it is provided to apply more detailed techniques and analysis for optimizing the design criteria for embankments. The design criteria for the structures in a polder system depend on the probability of allowing flooding. A fixed protection level of T25 has been selected based on a deterministic relation between cost and benefits (preventing damage cost) in the actual designs. A more probabilistic approach to the flood risk and a differentiation of the failure probability of different parts enables us to define more specific norms for structures and embankments. It may need to re-align the existing embankment, usually to provide additional setbacks to avoid - going/bank erosion. This could cause additional disruption to some existing settlements beyond the strip of land required for raising crest levels.

b) **Construction/repairing of the regulator and drainage cum flushing-inlet/sluice:** Regulators and drainage cum flushing inlets/ sluices of many polders are not functioning properly due to natural sedimentation and poor maintenance of the structures. These structures will be rehabilitated under the CEIP-2 project to improve the drainage system in the polders. Improvement of these structures will involve mainly civil construction works, installation of equipment, and shifting of drainage channels (in some cases to rehabilitate the old regulators). The improved structures are designed to accommodate higher precipitation and the effect of sea-level rise on river levels due to climate change. An additional regulator or sluice may be constructed for the individual polder to improve the drainage system or retain water for irrigation purposes. A risk-based design approach will be applied to design the regulator or sluice under the CEIP-2 project.

c) **Drainage channel re-excavation:** Drainage channels in most coastal polders have been silted up, which needs to be re-excavated to improve the drainage condition in the polder areas. The major activities for drainage channel re-

excavation include dredging and disposal of spoil. Channel design will be performed by analyzing the drainage modulus of the catchment area.

d) **Repairing/ constructing inlet:** Many inlets in coastal polders' drainage and irrigation channels will be repaired or newly built to maintain the drainage and irrigation facilities in the polder area. Major activities for this intervention include earthworks and civil construction.

e) **Constructing channel closure regulator:** A closure Regulator may be required in some channels of coastal polders to protect from tidal/ storm surges. Closure Regulator construction will mainly include earthworks and a discharge structure to accommodate the drainage blocked by the dam.

f) **Afforestation:** The component will support secondary maintenance schemes for improving O&M and embankment afforestation to protect the embankment toe against erosion. Species selection of trees on the embankment slopes will commence after completing earthworks in restored and new embankments. The species for plantation needs to be selected appropriately.

g) **Environmental and Social Management Plan:** The project has incorporated the implementation of the Environmental and Social Management Plan as one of the components. The project recognizes the importance of Environmental and Social management in the rehabilitation of coastal polders, which is a positive direction of recognizing the importance of environmental and social management in project implementation.

1.3 Purpose of ESMF

This Environmental and Social Management Framework (ESMF) aims to outline a Framework for the Environmental and Social Assessment and Management, giving brief details of potential Environmental and Social issues typically associated with the planning and implementation of the project activities envisaged under the World Bank Policy. For ensuring good environmental and social management in the proposed CEIP-2 project, the ESMF will guide pre-investment works/ studies (such as environmental and social screening, environmental and social assessment, environmental and social management plans, etc.), provide a set of steps, process, procedure, and mechanism for ensuring an adequate level of environmental and social consideration and integration in each investment in the project-cycle; and describes the principles, objectives, and approach to be followed to avoid or minimize or mitigate impacts. The Environmental and Social Framework (ESF) of the World Bank is comprised of Ten Environmental And Social Standards, including ESS1:Assessment and Management of Environmental and Social Impacts; ESS2: Labor and Working Condition; ESS3:Resource Efficiency Pollution Prevention and Management; ESS4:Community Health and Safety; ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement; ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources; ESS7: Indigenous People/Sub-Saharan African Historically Underserved and Traditional Communities; ESS8: Cultural Heritage; ESS9:Financial Intermediaries; and ESS10: Stakeholder Engagement. The ESMF will facilitate compliance with the Government of Bangladesh's policies, acts, and rules and the World Bank's environmental and social standards (ESSs) of the newly adopted Environmental and Social Framework (ESF). Guide to prepare and conduct the detailed ESA/IEE/ESIAs/ESMPs of the later stages of the CEIP-2 as appropriate to the project components/sub-components. While this ESMF document has been prepared to identify the potentially negative impacts of the CEIP-2, the specific objectives are to:

- integrate the environmental and social concerns into the identification, design, and implementation of all project interventions to ensure that those are environmentally sustainable and socially feasible;
- ensure that all relevant environmental and social issues are mainstreamed into the design and implementation of the project activities;
- consider in an integrated manner the potential environmental and social risks, benefits, and impacts of the program and identify measures to avoid, minimize and manage risks and impacts while enhancing benefits;
- ensure compliance with national laws and regulations and World Bank requirements. The ESMF presents potential impacts of the CEIP-2, mitigation, enhancement, contingency and compensation measures, environmental and social management and monitoring plan, and institutional framework, including inter-agency cooperation for implementing ESMP.

1.4 The rationale of the ESMF

Bangladesh Water Development Board (BWDB), through its CEIP project, aims to increase the area protected in selected polders from tidal flooding and frequent storm surges, which are expected to worsen due to climate change; improve agricultural production by reducing saline water intrusion in selected polders, and improve the Government of Bangladesh's capacity to respond promptly and effectively to an eligible crisis or emergency financed by the World Bank. An Environmental and Social Management Framework (ESMF) was developed for CEIP-1. These frameworks, however, were developed following the World Bank's old safeguard policies, which will no longer apply to the CEIP-2. The new Environmental and Social Framework (ESF) of the World Bank will be used for CEIP-2. In this regard, the ESMF for the existing Bank-financed project with BWDB needs to be updated to meet the requirements of the ESF.

The component interventions' number, type, and locations will be decided over the project implementation stage. At the implementation level, beneficiary groups and sites for any small infrastructures will be known. Therefore, social issues and impacts could not be identified and specified for mitigation at the preparation stage. BWDB will screen sites for project interventions and identify the target group beneficiaries at the implementation level to prepare and implement any social action plans. Hence, there is a need for procedural guidance for social preparation and management. BWDB has prepared the Environmental and Social Management Framework (ESMF) as a constituent part for guidance in the implementation stage.

The rationale for developing the framework is based on the consideration that all subprojects under the BWDB Components will only be identified and prepared during the implementation of CEIP-2. Therefore, detailed site investigations will be carried out to identify specific project activities and related designs at the selected locations to ascertain the precise nature of the environmental and social impacts. The ESMF will provide the necessary background for environmental and social considerations, a checklist of potential issues of the project activities to be considered and built into the design of the project so that socially sustainable implementation can take place, including environmental and social screening of subprojects and guidance on the preparation of specific assessments and plans. The ESMF has been prepared following the relevant national laws, policies, and guidelines and compliance with major development partners' environmental and social safeguard policies working in Bangladesh.

The ESMF will help identify the nature and magnitude of impacts continuously. As the impact details become available, the ESMF will provide the basis to carry out environmental and social screening and impact assessment and preparation and implementation of environmental and

social management plans, including environmental management plan (EMP), and resettlement action plan (RAP), as may be required to mitigate adverse impacts under the individual subprojects in each program project. This ESMF will also serve as the guideline for the staff designated by the implementing agencies - the BWDB to oversee and monitor the social safeguards compliance of the project components coming under their implementation responsibility. The ESMF will be reviewed and updated as a living document in the subsequent project phases based on experience and lessons learned from preceding projects periodically.

1.5 Scope of ESMF

A pragmatic approach will be applied to prepare the ESMF under the CEIP-2. So, this ESMF would be applied to a broad range of implementations of the CEIP-2 project. A shortlist of ESMF is described below:

- This ESMF will be prepared to improve the polder within the Coastal Zone for development, rehabilitation, and maintenance to enhance the coastal region's social and living conditions. The ESMF applies to all proposed CEIP-2 project activities and through polder development stages, i.e., pre-planning, planning, design, implementation, and post-implementation. The design flow of ESMF activities will be coordinated and integrated into the project cycle.

- The concepts and procedures presented in this framework are intended to help BWDB, stakeholders, and project proponents fulfill their social responsibilities as required under the national laws, policies, guidelines, and regulations.

- This ESMF will help keep the overriding environmental and social responsibilities firmly in mind during the scoping process while conducting the initial environmental and social screening (IESS) or environmental and social impact assessment (ESIA) regarding the program projects. It will also aid in compliance monitoring regarding each polder's environmental and social management plans, including ESIA, ESMP, RAP, and LAP.

1.6 Approach and Methodology of the ESMF

The ESMF has been prepared following the standard methodology of the steps listed below. The methods for preparing the ESMF are presented in Figures 1-3.

- Review Project documents and meetings/ discussions with various stakeholders, including BWDB and World Bank
- Review policy and regulatory requirements
- Reconnaissance field visits and initial scoping and screening to determine the key environmental and social parameters and aspects that are likely to be impacted by the Project activities
- Collection and analysis of baseline environmental and social data, with the help of secondary literature review and field data collection
- Consultations with the stakeholders, including beneficiary/ affected communities, and developing the consultation process
- Review the potential and likely impacts of the program activities and carry out the sub-project screening.
- Outline the detailed procedures to comply with the WB and GoB rules and regulations, including preparation of various safeguard documents, monitoring mechanism,

stakeholder engagement, disclosure requirement, grievance redress, and institutional arrangement.

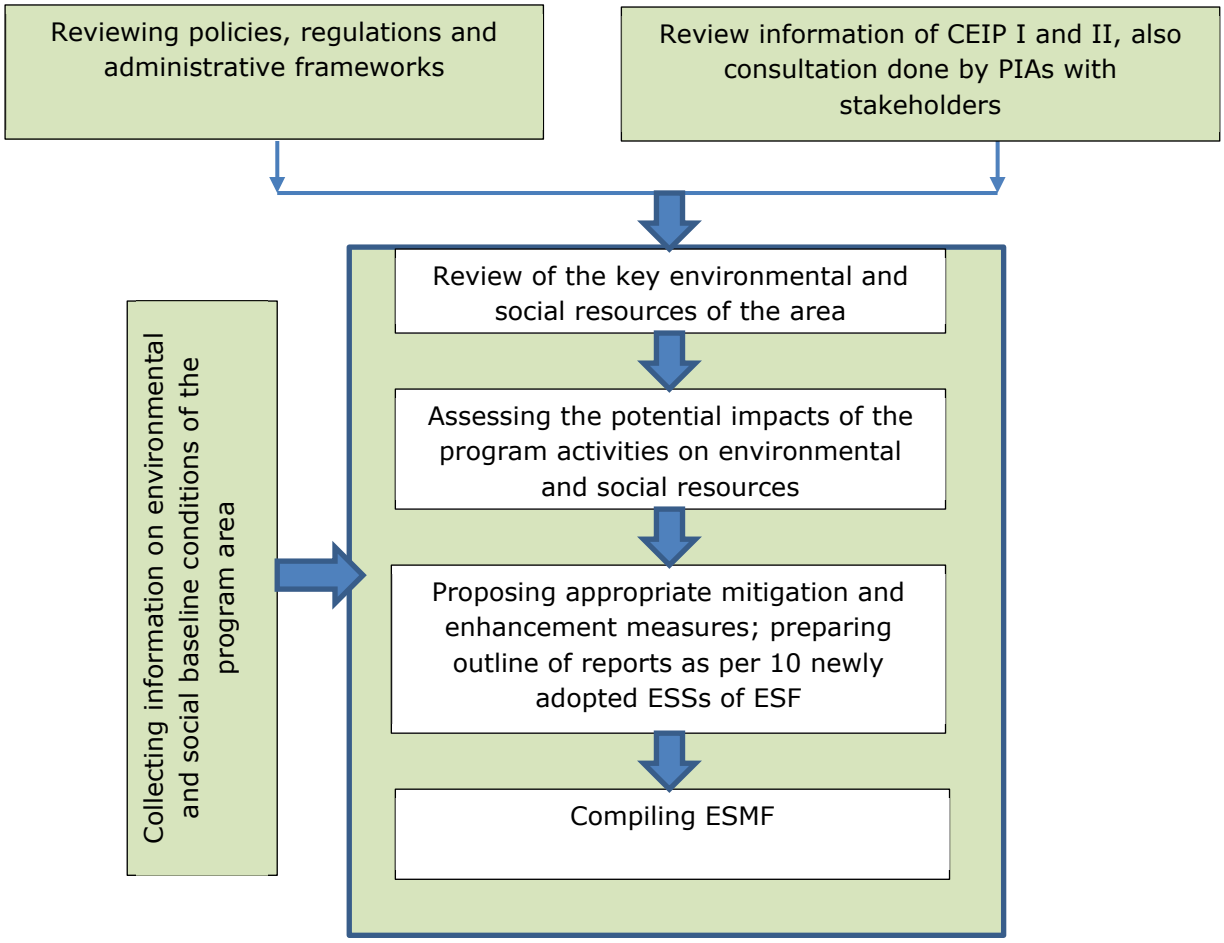

Figure 1-4: Approach for ESMF Preparation

1.7 Structure of ESMF

The ESMF report is presented under the following chapters:

Chapter 1: Introduction that provides a background of the project; project description including components; methodology adopted for the preparation of ESMF for CEIP 2.

Chapter 2 presents a simplified description of the CEIP- 2 project, its various components, and other salient information relevant for environmental and social impact assessment.

Chapter 3 reviews the prevailing national and WB regulatory framework applicable to the environmental and social assessment.

Chapter 4 describes the environmental and social assessment procedures.

Chapter 5 describes the potential environmental and social impact of the various phases of the CEIP-2.

Chapter 6 describes the methodological framework for environmental and social management to implement the ESMF.

Chapter 7 describes the institutional framework and capacity-building plan to implement the ESMF.

Finally, **Chapter 8** elaborates on the Stakeholder Engagement approach, the key findings from the ongoing consultations with the stakeholders, and the stakeholder mapping and analysis procedure.

2. ENVIRONMENTAL LEGAL, REGULATORY, AND POLICY FRAMEWORK

2.1 National Framework (Acts, Rules, Policies, and Strategy)

The importance of environmental consideration related to construction and rehabilitation projects has been recognized in several national documents that set the legal and regulatory framework for managing the water resources environment. In addition, 'Guidelines for Environmental Assessment of Water Management, 2003' approved by the Water Resources Planning Organization (WARPO) under the National Water Management Plan Project, is a useful reference document. The major water resources management related policies are described briefly:

2.1.1 National Environmental Policy, 1992

The National Environmental Policy (NEPO) is one of the Government's keys and earlier policy documents. The policy addresses 15 sectors and provides the legal framework and institutional arrangements directives. The coastal and marine environment is one of the sectors. The policy declarations that have particular bearing on the Integrated Coastal Zone Management (ICZM) are highlighted below:

- Sustainable use of coastal & marine resources and preservation of coastal ecosystem;
- Prevention of national and international activities causing pollution in the coastal and marine environment;
- Strengthening research in the protection and development of coastal & marine resources and the environment;
- Exploration of coastal and marine fisheries to a maximum sustainable limit
- The policy also stated regarding 'Water development, flood control and irrigation' sector to;
- ensure environmentally-sound utilization of all water resources;
- ensure that water development activities and irrigation networks do not create adverse environmental impacts;
- ensure that all steps are taken for flood control, including the construction of embankments, dredging of rivers, digging of canals, etc., be environmentally sound at local, zonal, and national levels;
- ensure mitigation measures of the adverse environmental impact of completed water resources development and flood control projects;
- keep the rivers, canals, ponds, lakes, haors, baors, and all other water bodies and water resources free from pollution;
- ensure sustainable, long-term, environmentally sound, and scientific exploitation and management of the underground and surface water resources; and
- conduct environmental and social impact assessment before undertaking water resources development and management projects.

2.1.2 National Environmental Policy, 2018

The National environment policy 1992 is modified, corrected and refined as the National environment policy 2018.

The objectives of the National Environmental Policy are as follows:

- Provide natural balance and sustainability to the country through environmental protection and sustainable management
- Expansion of adaptation activities to mitigate the adverse effects of climate change in the country;
- Encouraging the acquisition and introduction of low carbon emissions technologies in the country;
- Detection and control of all types of environmental pollution and erosion;
- Ensuring environmentally friendly development in all areas;
- Providing sustainable, long-term, and environmentally friendly use of all-natural resources.
- Unveiling and expanding areas of cooperation at the regional and international levels in global environmental development;
- Building environmental education, capacity building, public awareness, and public opinion in environmental protection;
- Public-private initiatives for environmental development (Public-Private Partnership)
- Integrate and harmonize environmental policies and strategies with other policy disciplines in the interest of sustainable development Translations into Assamese:
- To build a population capable of dealing with all kinds of environmental and environmental problems, including climate change;
- In all cases, necessary Environmental Impact Assessment and Strategic Environmental Assessment Should be performed.
- To discourage artificial infiltration of species and animals, if necessary, decision making through adequate research;
- To be as actively involved as possible with all international environmental initiatives and at the local and national levels, take necessary action;
- Taking steps to alleviate poverty through environmental protection;
- Strengthen observations on the proper observance of environmental laws and regulations.

The CEIP-2 project interventions should comply with these policy directives, reducing adverse environmental impacts. The ESMF and ESIA studies of the coastal polders should address the potential impacts and possible mitigation measures. Before the Clearance Certificate, the Responsible Agency (DoE) would confirm that the environmental and social issues, influence, and potential mitigation are mentioned in the ESIA study.

2.1.3 National Environment Management Action Plan (NEMAP), 1995

The National Environment Management Action Plan (NEMAP, 1995) identified the main national environmental issues, including the water sector. The main water-related national concerns included flood damage, riverbank erosion, environmental degradation of water bodies, increased water pollution, shortage of irrigation water, and drainage congestion; various specific regional concerns were also identified.

2.1.4 Environmental Conservation Act (ECA), 1995 (Amendment 2010)

The Environmental Conservation Act (ECA) of 1995 is the main legislative framework document relating to environmental protection in Bangladesh. This umbrella Act includes laws for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. This Act established the Department of Environment (DoE) and empowered its Director-General to take measures as he considers necessary.

Including conducting inquiries, preventing probable accidents, advising the Government, coordinating with other authorities or agencies, and collecting & publishing information about environmental pollution. According to this act (Section 12), no industrial unit or project shall be established or undertaken without obtaining, in a manner prescribed by the accompanying Rules, an Environmental Clearance Certificate (ECC) from the Director-General of DOE. As per this act, the CEIP-2 project will need to be cleared by DoE before implementing the project following procedures given in the Environmental Conservation Rules (ECR) 1997. Also, the Ecologically Critical Areas in the coastal zone, defined by DoE under this act, should be considered while planning and designing the CEIP-2 project interventions.

Amendment 2010 of the act (ECA) introduces new rules and restrictions. No individual or institution (Gov. or Semi Gov./Non-Gov./Self Governing) clarified defining wetlands and Ecologically Critical Areas. It included many important environmental concerns such as conservation of wetlands, hill cutting, ship breaking, and hazardous waste disposal. In the case of national interest, it can be done after getting clearance from the respective department. The owner of the industries will be bound to ensure proper management of their hazardous wastes to prevent environmental pollution and health risk. No demarked water body can be filled up/changed. In the case of national interest, it can be done after getting clearance from the respective department. And Emitter of any activities/incident will be bound to control environmental pollutants that exceed the existing emission standards. This amendment empowered the government to enforce more penalties than before. Moreover, affected persons were given provisions to put objections or take legal actions against the polluters or any entity creating nuisance to the affected person.

2.1.5 Bangladesh Environmental Conservation Rules (ECR), 1997

The Environment Conservation Rules, 1997, were issued by the Government of Bangladesh to exercise power conferred under the Environment Conservation Act (Section 20), 1995. Under these Rules, the following aspects, among others, are covered:

- Declaration of ecologically critical areas
- Classification of industries and projects into four categories
- Procedures for issuing the Environmental Clearance Certificate
- Determination of environmental standards

These Rules were amended three times (17 February 2002, 26 August 2002, and 01 April 2003) to specify different sections like the inclusion of Certificate of Fitness, Pollution Under Control Certificate, Fees for Environmental Clearance Certificate, and other services.

Rule 3 defines the factors to be considered in declaring an area 'ecologically critical area' (ECA) as per Section 5 of ECA'95. The Government can claim an area 'ECA' if it is satisfied that its ecosystem has reached or is threatened to reach a critical state or condition due to environmental degradation. The Government is also empowered to specify which operations or processes shall be carried out in the ecologically critical area. Under this mandate, MoEF has declared eight areas as ECAs in 1999. Sundarban, Cox's Bazar-Teknaf Sea Shore, Saint Martin Island, Sonadia Island, Hakaluki Haor, Tanguar Haor, Marzat Baor, and Gulshan-Baridhara Lake are included as ECA and prohibited certain activities in those areas. Besides these, recently, the government of Bangladesh has declared four rivers, such as Buriganga River, Turag River, Shitolakha River, and Balu River, around Dhaka City, as ECA.

2.1.6 Bangladesh Environment Court Act, 2010

Bangladesh has developed a new environmental legal regime in response to various international conventions, treaties, and protocols, including environmental governance institutions. In 2010, a fresh Environment Court Act (Bangladesh Environment Court Act, 2010) was passed, and the Act of 2000 was repealed to the consistent with the international standard. Bangladesh Environment Court Act, 2010 was enacted to resolve the disputes and establish justice over environmental and social damage raised due to any development activities. This act allows the government to take necessary legal action against any parties which create environmental hazards/ damage to environmentally sensitive areas and human society. According to this act, the government can take legal steps if any environmental problem occurs due to CEIP-2 project interventions.

The aim and objective of the Act are to materialize the Environmental Conservation Act 1995 through judicial activities. This Act established Environmental Courts (one or more in every division), set the jurisdiction of the courts, and outlined the procedure of activities and power of the courts, right of entry for judicial inspection and appeal, and the constitution of the Appeal Court.

2.1.7 National Water Policy (NWPo), 1999

The National Water Policy (NWPo) has 50 clauses relevant to the environment. It is intended that compliance with the Policy will ensure the protection, restoration, and preservation of natural habitats, particularly wetlands, mangroves, other forests, and endangered species that depend on them (UNEP, 2001). Specific provisions made under the Policy include:

- Protection, restoration, and enhancement of water resources;
- Protection of water quality, including strengthening regulations concerning agrochemicals and industrial effluent;
- Sanitation and potable water;
- Fish and fisheries; and
- Ensure participation of local communities in all water sector development.

The NWPo is to be implemented under the National Water Management Plan (NWMP), the drafting of which has involved the revival of the dormant National Water Resources Council (NWRC). The NWRC led the NWPo development process culminating in the first National Water Policy published in January 1999.

2.1.8 National Water Management Plan, 2001 (Approved in 2004)

The National Water Management Plan (NWMP) 2001, approved by the National Water Resources Council in 2004, envisioned establishing an integrated development, management, and use of water resources in Bangladesh over 25 years. Water Resources Planning Organization (WARPO) was assigned to monitor the national water management plan. The major programs in the plan have been presented under eight sub-sectoral clusters: i) Institutional Development, ii) Enabling Environment, iii) Main River, iv) Towns and Rural Areas, v) Major Cities; vi) Disaster Management; vii) Agriculture and Water Management, and viii) Environment and Aquatic Resources. Each cluster comprises several individual programs, with 84 sub-sectoral programs identified and presented in the investment portfolio. Most programs may be implemented in coastal areas out of 84 programs, particularly AW 007: Rationalization of existing FCD infrastructures; and AW008: Land reclamation, coastal protection, and afforestation programs and programs related to institutional capacity building of BWDB for water management related

to CEIP project. These programs (e.g., AW007, AW008) were implemented under different projects. CEIP project will also partially implement these programs in the coastal area.

2.1.9 Coastal Zone Policy, 2005

The Government has formulated the coastal zone policy (CZPo) that would provide general guidance to all concerned for the management and development of the coastal zone so that the coastal people can pursue their life and livelihoods within a secure and conducive environment.

The coast of Bangladesh is prone to natural disasters like cyclones, storm surges, and floods. In this regard, for reducing risk, the policy emphasized the improvement of coastal polders as stated in section 4.3 (e): Safety measures will be enhanced by combining cyclone shelters, multi-purpose embankments, killas, road systems, and disaster warning systems. But, the policy does not indicate the environmental assessment for the development project in the coastal area.

2.1.10 Coastal Development Strategy, 2006

The Coastal Development Strategy (CDS) focuses on implementing the coastal zone policy. The CDS was approved at the second meeting of the Inter-Ministerial Steering Committee on ICZMP held on 13 February 2006. Nine strategic priorities, evolved through a consultation process, guides interventions and investments in the coastal zone:

- ensuring fresh and safe water availability
- safety from manufactured and natural hazards
- optimizing the use of coastal lands
- promoting economic growth, emphasizing non-farm rural employment
- sustainable management of natural resources: exploiting untapped and less explored
- opportunities
- improving livelihood conditions of people; especially women
- environmental conservation
- empowerment through knowledge management
- creating an enabling institutional environment

2.1.11 National Land-Use Policy (MoL, 2001)

The National Land Use Policy (NLUPo), enacted in 2001, aimed to manage land use effectively to support trends in accelerated urbanization, industrialization, and diversification of development activities. The NLUPo urges that increasing the country's land area may be impossible through the artificial land reclamation process, which is cost-effective only in the long run. Therefore, land use planning should be based on the existing and available land resources. The policy suggests establishing land data banks where, among others, information on accreted riverine and coastal chars will be maintained. Among the 28 policy statements of NLUPo, the followings are relevant to the coastal area:

- forests declared by the Ministry of Forests and Environment will remain as forest lands;
- reclassification of forest lands will be prevented; and
- effective green belts will be created all along the coast.

2.1.12 National Agriculture Policy, 1999

The overall objective of the National Agriculture Policy is to make the nation self-sufficient in food by increasing the production of all crops, including cereals, and ensure a dependable food security system for all. Although the policy does not emphasize the coastal zone separately, all specific objectives apply to the development of coastal zone agriculture. The policy particularly stressed minor irrigation capturing tidal water in reservoirs in coastal areas and research on improved varieties and technologies for cultivation in coastal, hilly, water-logged, and salinity-affected regions. The policy also recognizes that adequate measures should reduce waterlogging salinity and provide irrigation facilities for crop production.

2.1.13 National Fisheries Policy, 1996

The National Fisheries Policy, 1996 recognizes that fish production has declined due to environmental imbalances, adverse environmental impact, and improper implementation of fish culture and management programs. The policy focuses on coastal shrimp, aquaculture, and marine fisheries development.

2.1.14 National Livestock Development Policy, 2007

The National Livestock Development Policy has been prepared to address the key challenges and opportunities for comprehensive sustainable development of the Livestock subsector by creating an enabling policy framework. Among 60 or more policy statements, the following two policy statements mention the coastal zone. The LDPo does not recognize the coastal zone separately.

2.1.15 Forestry Laws and Policies

Systematic management of forests started in the 1860s after establishing a Forest Department in the Province of Bengal. Rules and regulations have been formulated, amended, modified, and improved upon to regulate forest activities. These rules and regulations are developed based on long-existing Laws and policies.

2.1.16 Forest Act 1927 (Amendment 2000)

The Forest Act of 1927, as amended in 1989, has its roots in the Indian Forest Act of 1878. The Forest Act grants the government several elemental powers, largely for conserving and protecting government forests and limited powers for private forests. The 1927 version of the act was amended in 1989 for extending authority over "any [Government-owned] land suitable for afforestation."

The Forest department is the main agency that implements the provisions of the Forest Act. The Act, however, does not specify any institutional structure for the forest or other landholding agencies. It also does not set out any specific policy direction for managing the forests.

Most of the forest lands under the management of the forest department are areas declared to be reserved and protected forests under this act. The Act empowers the government to regulate forest produce's felling, extraction, and transport.

2.1.17 Private Forest Ordinance (PFO), 1959

The Private Forest Act of 1959 allows the Government to manage improperly managed private forest lands, private lands afforested, and any land is lying fallow for more than three years. The Private Forest Ordinance was originally enacted in 1945 as the Bengal Private Forest Act. It was re-enacted by Bangladesh (then East Pakistan) in 1949 before being issued as an Act in 1959. These government-managed lands under this act are called "vested forests." The Forest Department manages approximately 8,500 hectares as "vested forests." This area is relatively small, but the area historically affected by this law is much larger.

PFA, 1959 empowers the government to require management plans for private forests and assume private forests as vested forests. Government has broad powers to write rules regarding the use and protection of vested forests and apply rules to "controlled forests," including all private forests subject to any requirement of the Act.

2.1.18 Private Forest Policy 1994

The policy suggested for extended effort to bring about 20% of the country's land under the afforestation programs of the government and private sector by the year 2015 by accelerating the pace of the program through the coordinated efforts of the government and NGOs and active participation of the people to achieve self-reliance in forest products and maintenance of ecological balance. The policy viewed equitable distribution of benefits among the people, especially those whose livelihood depends on trees and forests, and people's participation in afforestation programs and incorporation of people's opinions and suggestions in the planning and decision-making process.

The people-centered objectives of the policy are the creation of rural employment opportunities and expansion of forest-based rural development sectors; and the prevention of illegal occupation of forest lands and other forest offenses through people's participation. The policy statements envisage massive afforestation on marginal public lands through partnerships with local people and NGOs; afforestation of denuded/encroached reserved forests with an agroforestry model through the participation of people and NGOs; giving ownership of a certain amount of land to the tribal people through forest settlement processes; strengthening of the Forest Department; strengthening of educational, training and research facilities; and amendment of laws, rules and regulations relating to the forestry sector and if necessary, the promulgation of new laws and rules. Thus, over time the policy has shifted from total state control to a management regime involving local communities in specific categories of forests.

Because of the limited amount of forestland, the policy underscores effective measures for afforestation in rural areas, in the newly accreted char in the coastal regions, and in the denuded Unclassed State Forest areas Chittagong Hill Tract and northern zone of the country, including the Barind tract. The policy also encourages the private sector participation in afforestation.

2.1.19 Social Forestry Rules, 2004 and Amendments

Social forestry was included in the Forest (Amendment) Act 2000, and the Social Forestry Rules were approved in 2004 (amended in 2010 and 2011). The Rules defined the process of beneficiaries' selection, roles and responsibilities of different stakeholders, management, capacity building, and distribution of earnings from social afforestation. According to the rules, the beneficiaries shall be selected among the local communities and shall preferably be from amongst the following persons, namely:

(a) landless persons; (b) owners or occupants of less than 50 decimals of land; (c) destitute women; (d) unprivileged community; (e) poor ethnic minority; (f) poor forest villages; and (g) insolvent freedom fighters or insolvent successor of freedom fighters. The rules provided the rotation period for different plantations and benefit-sharing. In general, the communities responsible for the maintenance of plantations will receive around 45% of the timber value of the forest.

2.1.20 Standing Orders on Disaster, 2010

The Standing Orders on Disaster' is designed to enhance all government administrative and social structures for coping with and recovering from disasters. The document contains guidelines for construction, management, maintenance, and use of the cyclone shelter center. Accordingly, to the guideline, geographical information system (GIS) technology will be applied at the planning stage to select the location of the cyclone shelter, considering habitation, communication facilities, distance from the nearest cyclone center, etc. The advice of the concerned District Committee is to be obtained before the final decision.

The cyclone shelters should have easier communication facilities so that delays do not occur in times of distress. For this reason, the road communication from the cyclone shelters should link up with the city or main road and neighboring village areas. Provision of emergency water, food and sanitation, and shelter space for livestock during the period should also be kept in view for future construction of shelters.

2.1.21 Antiquities Act, 1968

An Act to consolidate and amend the law relating to the preservation and protection of antiquities.

This Act may be called the Antiquities Act, 1968. In this Act, unless there is anything repugnant in the subject or context -

a. ''immovable antiquity" means antiquity of any of the following descriptions, namely:

i. any archaeological deposits on land or underwater,

ii. any archaeological mound, tumulus, burial place or place of interment, or any ancient garden, structure, building erection, or other work of historical, archaeological, military, or scientific interest, any rock, cave, or other natural objects of historical, archaeological, artistic, or scientific interest or containing sculpture, engraving, inscription, or painting of such claim, also includes -

4. any gate, door, window, paneling dados, ceiling, inscription, wall-painting, woodwork, ironwork, or sculpture of other things which is attached or fastened to immovable antiquity;

5. the remains of an immovable antiquity;

6. the site of an immovable antiquity;

7. such portions of land or water adjoining the site of immovable antiquity as are reasonably required for fencing or covering or otherwise preserving such antiquity;

8. the reasonable means of access to, and convenient inspection of, immovable antiquity; and

9. any urban site, street, group of buildings, or public square of special value that the Central Government, believing that its preservation is a matter of public interest because of its arrangement, architecture, or materials of construction, by notification in the official Gazette declares to be immovable antiquity for this Act;

2. Advisory Committee. - For this Act, the Central Government shall constitute an Advisory Committee consisting of the following members, namely: -

a. the Director, who shall also be its Chairman;

b. two members of the National Assembly of Pakistan, one being from each Province; and

c. (c) three other persons having special knowledge of antiquities.

3. Dispute as to whether any product, etc., is antiquity. - If any question arises whether any product, object or site is an antiquity within the meaning of this Act, it shall be referred to the Central Government, which shall, after consultation with the Advisory Committee, decide the same; and the decision of the Central Government shall be final.

4. Prohibition of destruction, damage, etc., of antiquities.

2.1.22 National Adaptation Programs of Action (NAPA)

47. In 2005, the Ministry of Environment and Forest (MoEF), the Government of the People's Republic of Bangladesh has prepared the National Adaptation Program of Action (NAPA) for Bangladesh as a response to the decision of the Seventh Session of the Conference of the Parties (CoP7) of the United Nations Framework Convention on Climate Change (UNFCCC). The basic approach to NAPA preparation was along with the country's sustainable development goals and objectives. It has recognized the necessity of addressing climate change, environmental issues, and natural resource management. The NAPA is the beginning of a long journey to address adverse impacts of climate change, including variability and extreme events, and promote sustainable development. There are 15 adaptation strategies suggested for Bangladesh to address the adverse effects of climate change. Among the 15 adaptation strategies, the following strategies have been taken for the coastal region to reduce climate change-induced vulnerability.

- Reduction of climate change hazards through coastal afforestation with community participation
- Providing drinking water to coastal communities to combat enhanced salinity due to sea-level rise
- Construction of flood shelter and information and assistance center to cope with enhanced recurrent floods in major floodplains
- Promotion of research on drought, flood, and saline tolerant varieties of crops to facilitate adaptation in future
- Promoting adaptation to coastal crop agriculture to combat increased salinity
- Promoting adaptation to coastal fisheries through a culture of salt-tolerant fish special in coastal areas of Bangladesh

2.1.23 Bangladesh Climate Change Strategy and Action Plan (BCSAP) 2009

The Government of Bangladesh has prepared the Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009. The BCCSAP is built on six pillars. Three programs have been suggested for improvement (repair and rehabilitation) of the existing coastal polders of Bangladesh under pillar 3 (Infrastructure) of BCCSAP. The CEIP project will further contribute to achieving the objective of other pillars such as (i), (ii), and (iv).

2.1.24 Embankment and Drainage Act, 1952

The East Bengal Act No. 1, 1953 was amended in 1953, adapted by the People's Republic of Bangladesh, by the Bangladesh Order (adaptation of Existing Laws), 1972 (President's Order No. 48 of 1972). The Act consolidates the laws relating to embankments and drainage, providing provision for the construction, maintenance, management, removal, and control of embankments and watercourses for better drainage of lands and their protection from floods, erosion, or other damage by water. The specific Sections and Articles relevant to the Project are mentioned below:

☐ Section 4 (1) of the Act states that the embankment, water-course, tow-path, earth, pathways, gates, berms, and hedges of the embankments shall vest in the Government of the Authority (BWDB).

☐ Section 56 (1) states that a person will be subject to a penalty (500 takas or imprisonment. If he erects, or causes of wilfully permits to be erected, any new embankment, any existing embankment or obstructs or diverts, or causes or wilfully permits to be obstructed or diverted, any watercourse.

☐ Section 15 allows the engineer (engineer in charge of Divisional level BWDB) to construct new embankments or enlarge, lengthen, or repair existing embankments.

☐ The other sections of the Act give powers and access to the Government or Authority or Engineers to commence necessary Project activities for land acquisition (through the Deputy

Commissioner), and site clearing activities, including removing trees or houses (if required). The Act consolidates the laws relating to embankments and drainage, providing provision for the construction, maintenance, management, removal, and control of embankments and watercourses for better drainage of lands and their protection from floods, erosion, or other damage by water. The projects will include interventions in the water bodies, bridges, ghats, etc.

2.1.25 Bangladesh Labour Act, 2006

The Bangladesh Labor Act, 2006 guides employers' extent of responsibility and workers' extent of the right to get compensation in case of injury by accident while working. Some of the relevant sections are:

☐ Section 150. Employer's Liability for Compensation: (1) If personal injury is caused to a workman by accident arising out of and in the course of his employment, his employer shall be liable to pay compensation in accordance with the provisions of this Act; and (2) Provided that the employer shall not be so liable - (a) in respect of any injury which does not result in the total or partial disablement of the workman for a period exceeding three days; (b) in respect of any injury, not resulting in death or permanent total disablement, caused by an accident which is directly attributable to - (i) the workman having been at the time thereof under the influence of drink or drugs, or (ii) the willful disobedience of the workman to an order expressly given, or to a rule expressly framed, for the purpose of securing the safety of workmen, or (iii) the willful removal or disregard by the workman of any safety guard or other device which he knew to have been provided for the purpose of securing the safety of workmen.

☐ Section 151. (1) Amount of Compensation: Subject to the provisions of this Act, the amount of compensation shall be as follows, namely: (a) where death results in an amount equal to fifty from the injury cent of the monthly wages of the deceased workman multiplied by the relevant factor; or an amount of fifty thousand rupees, whichever is more; (b) where permanent total an amount equal to disablement results from sixty the injury percent of the monthly wages of the injured workman multiplied by the relevant.

The Act guides the employer's extent of responsibility and workers' extent of the right to compensation in case of injury by accident while working. The projects require substantial labor from local and external areas, and the project will follow the Act in managing the laborers for the project.

2.1.26 Bangladesh National Building Code, 2006

Part-7, Chapter -1 of the Bangladesh National Building Code (BNBC) sets out the constructional responsibilities according to which the relevant authority of a particular construction site shall

adopt some precautionary measures to ensure the safety of the workers. According to section 1.2.1 of 19 Chapter 1 of part 7, "In a construction or demolition work, the contract terms between the owner and the contractor and between a consultant and the owner shall be clearly defined and put in writing. These, however, will not absolve the owner from any of his responsibilities under the various provisions of this Code and other applicable regulations and bye-laws. The terms of the contract between the owner and the contractor will determine the responsibilities and liabilities of either party in the concerned matters within the provisions of the relevant Acts and Codes (e.g.) the Employers' Liability Act, 1938, the Factories Act 1965, the Fatal Accident Act, 1955 and Workmen's Compensation Act 1923". (After introducing the Bangladesh Labor Act, 2006, these Acts have been repealed).

The Code sets out the constructional responsibilities according to which the relevant authority of a particular construction site shall adopt some precautionary measures to ensure the safety of the workers. The Code also clarifies the issue of the safety of workers during construction. The project will follow the instructions of the Code during the construction work of the Embankment.

Part-7, Chapter-3 of the Code has clarified the safety of workers during construction and, in relation to this, set out the details about the different safety tools of the specified standard. In connection with the health hazards of the workers during construction, this chapter describes the nature of the various health hazards that normally occur on the site during construction and, at the same time, specifies the specific measures to be taken to prevent such health hazards. According to this chapter, exhaust ventilation, use of protective devices, medical checkups, etc., are the measures to be taken by the particular employer to ensure a healthy workplace for the workers.

The Code in sections 3.7.1 to 3.7.6 of chapter 3 of part 7 sets out the detailed requirements on the formation and use of scaffolding to prevent workers from falling from heights. According to section 3.9.2 of the same chapter, "every temporary floor opening shall either have a railing of at least 900 mm height or be constantly attended. A railing shall guard every floor hole with a toeboard or a hinged cover.

Alternatively, the hole may be constantly attended to or protected by a removable railing. Every stairway floor opening shall be guarded by a railing at least 900 mm high on the exposed sides except at the entrance to the stairway.

A guard railing shall guard every ladderway floor opening or platform with toe board except at the entrance to the opening. Every open-sided floor or platform 1.2 meters above adjacent ground level shall be guarded by a railing on all open sides except the ramp, stairway, or fixed ladder entrance. The above precautions shall also be taken near the open edges of the floors and the roofs".

The major challenge is the proper implementation of the Code as section 2.1 of chapter 2 of part 1 duly states that "The Government shall establish a new or designate an existing agency responsible for the enforcement of this Code with a given area of jurisdiction. To administer and enforce the provisions of the Code, the enforcing agency shall have the authority of the Government and shall herein be referred to as the Authority." Part 9, 1.2.1 states that if the land is changed and the area's occupants are against the change, no change in use of an existing building will be allowed.

2.1.27 The Water Supply and Sanitation Act, 1996

The project will ensure water supply and sanitation facilities follow the instruction of the Act mentioned above in the project areas. It will make certain the health and hygiene issues of project areas.

2.1.28 Bangladesh Water Act, 2013

The Water Act 2013 is based on the National Water Policy and is designed for integrated development, management, extraction, distribution, usage, protection, and conservation of water resources in Bangladesh.

As per this Act, all forms of water (e.g., surface water, groundwater, seawater, rainwater, and atmospheric water) within the territory of Bangladesh belong to the government on behalf of the people. The private landowners will be able to use the surface water inside their property for all purposes in accordance with the Act. A worthwhile initiative requires permits/licenses for large-scale water withdrawal by individuals and organizations beyond domestic use. Without prior permission issued by the Executive Committee, no individuals or organizations will be allowed to extract, distribute, use, develop, protect, and conserve water resources, nor will they be allowed to build any structure that imped rivers' natural flow creeks.

Construction of the Polders may deteriorate the water quality. However, it should be ensured that water used for other purposes in surrounding areas is not hampered by taking mitigation measures.

2.1.29 Acquisition and Requisition of Immovable Property Act, 2017

Land acquisition in Bangladesh is governed by a) the Acquisition and Requisition of Immovable Property Act, 2017 (hereafter, the 2017 Act), which repealed the Acquisition and Requisition of Immovable Property Ordinance 1982 (with subsequent amendments of the latter up to 1994; subsequently 1982 Ordinance) and b) the East Bengal State Acquisition and Tenancy Act (1950) revised in 1994. The 2017 Act provides certain safeguards for the owners and has provision for payment of "fair value" for the property acquired. The 2017 Act also gives the right to the landowner to appeal against land acquisition within 15 (fifteen) days of notice (Section 5 of the 2017 Act). The appropriate procedure for such appeals is in place.

The 2017 Act requires that compensation be paid for the followings: (a) land and assets permanently acquired, including house, (b) loss of standing crops and trees; (c) loss of property value due to partial acquisition; (d) loss of other immovable or movable assets or source of income; and (e) relocation of living place or business and the cost incurred for such. The 2017 Act, however, does not cover project-affected persons (PAP) without titles or ownership records, such as informal settler/ squatters, occupiers, and informal tenants and lease-holders (without document), and does not ensure the replacement value of the property acquired. The Act has no provision for resettlement assistance and transitional allowances to restore the livelihoods of the non-titled affected persons.

The Deputy Commissioner (DC), in all cases, determines the "market value" of acquired assets on the date of notice of acquisition (note under Section 9 of the 2017 Ordinance). The assessment of this market value is done considering the average price of immovable properties of the same class, with similar facilities and within the vicinity of the "to be" permanently acquired land and assets. The DC then adds 200 percent and 300 percent premium of the assessed value for cash compensation under the law (CCL) of the land and support, including a house for government and non-governmental acquisitions. For any losses specified above, i.e.,

from (b) to (e), the DC adds a 100 percent premium of the assessed value to pay compensation. The CCL paid for land is generally less than the "market value" as owners customarily report lower values during registration to avoid or pay fewer taxes. If land acquired has standing crops cultivated by tenant (bargadar)[2] under a legally constituted written agreement, the law requires that part of the compensation money be paid in cash to the tenants as per the agreement. If there is a dispute regarding the amount of compensation, there is an option for arbitration, and the procedures for such are in place. Places of worship, graveyard, and cremation grounds are not to be acquired for any purpose unless the acquisition of these places is deemed unavoidable for the people's best interest. The proponent will be allowed to acquire such areas, given that it funds the replacement and rebuilding of such places. The DC processes land acquisition under the 2017 Act and pays compensation to the legal owners of the acquired land. The law requires that the Government auction out the salvaged materials upon payment of compensation. The Ministry of Lands (MoL) is authorized to deal with land acquisition through the DCs. Khas[3] lands should be acquired first when a project acquires Khas and private land. If a project acquires only khas, the land will be transferred through an inter-ministerial meeting following the acquisition proposal submitted to DC/ MoL.

2.1.30 Jal mahal Management Policy, 2009 (not listed by Harrie)

A more formal definition of Jal mahal, according to the "Jalmahal management policy 2009," is – Jalmahal is a waterbody where water sometimes remains or throughout the year and is known as Haor, Baor, Beel, Jheel, Pond, Ditch, Lake, Dighi, Khal, River, Sea, etc. Such Jalmahals can be closed or open. Closed Jalmahal will have defined boundaries, whereas open Jalmahal will not. The government holds the power of distributing this Jal mahal among the people. The neediest people are being ignored in the distribution of Jalmahal. But the government has an obligation towards them, and there should get priority, and policies should be taken to ensure that. The government has formulated the Government Water Resources Management Policy, 2009, in the public interest to prioritize the provision of settlements in favor of real fishers and conservation of biodiversity, including preservation of fishery resources and increase in production. Suppose the organization of real fishermen is registered at the local level in the Department of Cooperatives or the Department of Social Services. In that case, they will participate in the lease of local Jalmahal management. However, if a member of a society is not a real fisherman, then that society will not be eligible for any government Jalmahal settlement. No person or any unregistered association can apply to manage government water bodies.

2.1.31 National Policy for Arsenic Mitigation, 2004

The policy provides a guideline for mitigating the effect of arsenic on people and the environment holistically and sustainably. This will also supplement the National Water Policy 1998 and National Policy for Safe Water Supply and Sanitation 1998 in fulfilling the national poverty alleviation, public health, and food security goals. Screening and regular monitoring of all tube wells, including irrigation wells, to identify the wells with arsenic above the levels permissible in Bangladesh. Identification of all arsenic-affected patients and populations at risk. The water quality of all new water supply sources is tested before commissioning and assessing the level of arsenic in soil and agriculture products, including livestock. Raising awareness regarding the impact of ingestion of arsenic-contaminated water and raising awareness about alternative arsenic-free safe water sources and mitigation options. Increasing awareness

[2] Bargadar is a person who, under the system generally known as adhi, barga, or bhag, cultivates the land of another person on condition of delivering a share of produce of such land to that person.

[3] Khas land means government owned fallow land, where nobody has property rights. It is a land which is deemed to be owned by the government and available for allocation according to government priorities.

regarding remedial measures against arsenic poisoning; and raising awareness that arsenicosis is not contagious and that social exclusion is not justified.

2.1.32 National Biodiversity Conservation Strategy and Action Plan, 2004

Conserve and restore the biodiversity of the country. Maintain and improve the environmental stability of ecosystems. Ensure preservation of the unique biological heritage of the nation for the benefit of the present and future generations—guarantee safe passage and conservation of globally endangered migratory species, especially birds and mammals in the country. Stop introducing invasive alien species, genetically modified organisms, and living modified organisms.

2.1.33 Social Forestry Rules, 2004 and Amendments (not listed by Harrie)

Social forestry was included in the Forest (Amendment) Act 2000, and the Social Forestry Rules were approved in 2004 (amended in 2010 and 2011). The Rules defined the process of beneficiaries' selection, roles and responsibilities of different stakeholders, management, capacity building, and distribution of earnings from social afforestation. According to the rules, the beneficiaries shall be selected from amongst the local communities and shall preferably be from amongst the followings persons, namely: (a) landless persons; (b) owners or occupants of less than 50 decimals of land; (c) destitute women; (d) unprivileged community; (e) poor ethnic minority; (f) poor forest villages; and (g) insolvent freedom fighters or insolvent successor of freedom fighters. The rules provided the rotation period for different plantations and benefit-sharing. In general, the communities responsible for the maintenance of plantations will receive around 45% of the timber value of the forest.

2.1.34 Wildlife (Conservation and Security) Act, 2012

The Bangladesh Wildlife (Conservation and Security) Act, 2012 provides the country's conservation and safety of biodiversity, forest, and wildlife by repealing the previous laws, i.e., the Wildlife (Preservation) Act of 1973. The Department of Forest (DoF) has the primary responsibility for implementing this Act. The key features of this Act are:

- Prohibition made concerning wild animals and plants that no person can hunt any wild animal without a license or willfully pick, uproot, destroy or collect any plant;
- Determination of vulnerable, endangered, and critically endangered species of wild animals and plants;
- Declaration of sanctuary for the conservation of forest and habitat of wildlife and prohibitions made on such sanctuary;
- Requirement of license to cultivate, extract, manufacture, rear, export, or import any wild animal or part of its body, meat, trophy, uncured trophy, or any plant; and
- Restriction on import, export, and re-export of wild animals and plants.

This Act is applicable for this project because 'biodiversity' means genetic and species diversity of all species or subspecies of flora and fauna living in aquatic, terrestrial, and marine ecosystems or the diversity of their ecosystems. Wildlife species and their habitats would be damaged or disturbed due to the proposed activities for which mitigation measures must be implemented.

2.1.35The Protection and Conservation of Fish Act, 1950 and Rules, 1985

This Act and Rule covers aquatic species, including fish, prawns, shrimp, amphibians, tortoises, turtles, crustaceans, mollusks, echinoderms, and frogs at all stages in their lifecycle and all types of water bodies. The Act specifies a number of useful fisheries management rules for sustainable fish culture and conservation. These include using appropriate fishing gear (net, cage, trap, explosives) and building water management structures (dams, weirs, bunds, and embankments). It also specifies the fishing and non-fishing seasons and the size of fish below which any prohibited species cannot be killed or sold. This Act was revised and included the banning of 'jatka[4]' of hilsa and synthetic mesh (locally known as 'current jail[5]) in 2011.

2.1.36 Noise Pollution (Control) Rules, 2006

According to the Environment Protection Act, 1995, the government formulated the noise pollution Rules in 2006. The Rules have been improved through ECR 1997 (Amendment 2017). The ECR, 1997 (Amendment 2017) addresses the sound levels to be no more than 45dB in quiet areas[6] in the daytime (6 am to 9 pm) and 35 dB at night-time (9 pm to 6 am). In residential areas, these levels are 50 dB and 40 dB; in mixed[7] sizes, 60 dB and 50 dB; in commercial areas, 70 dB and 60 dB; and in industrial areas, 75 dB and 70 dB for daytime and night-time, respectively.

2.1.37 Disaster Management Act, 2012

The Disaster Management Act, 2012 aims to make disaster management activities coordinated, object-oriented, and strengthened and to formulate rules to build up the infrastructure of effective disaster management to fight all types of disasters. Disaster means any such incidents created by nature or humans.

Disaster (to a certain degree) may occur in the current project if any harmful situation occurs during the normal work or construction activity. Therefore, the project proponent should take an appropriate management plan to prevent any unwanted disaster in the plant.

This Act is particularly relevant to avoid accidental hazards in the construction, operation, and maintenance phases. The relevance of this act for this proposed project arises as follows:

- To make a disaster management plan for rehabilitation to bring back any infrastructure, life, livelihood, and working environment damaged by disaster to previous or better conditions.
- To create effective disaster management infrastructure to fight disasters and make the public concerned and strengthened to face the disasters.
- To ensure no obstacle is created in playing fire brigade and rescue vehicles during a fire broke out, earthquake, building slide, or other disasters.

[4] Any young fish returning to the sea are known as Jatka in Bangladesh. Jatka of hilsa refers to any hilsa smaller than or equal to nine inches in length;

[5] Current Jal" means fishing net made of monofilament synthetic nylon fibre of different mesh sizes;

[6] The area within 100 meters from hospital, academic institutions or places identified/identifiable by the government;

[7] An area, which is primarily a residential area with either or both commercial and industrial parts in it.

2.2 World Bank Environmental and Social Framework (ESF)

Since October 2018, all World Bank-funded Investment Project Financing (IPF) are required to follow the Environmental and Social Framework (ESF), consisting of ten (10) Environment and Social Standards (ESSs). These ESSs set out their requirement for the polder implementing agencies to identify and assess environmental and social risks and impacts of the CEIP-2 project. The ESSs support the information access (IAs) in achieving good international practice relating to environmental and social sustainability, assisting them in fulfilling their national and international environmental and social obligations, enhancing transparency and accountability, and ensuring sustainable development outcomes through ongoing stakeholder engagement.

The ESF sets out its commitment to sustainable development through Bank Policy and a set of Environmental and Social Standards designed to support the CEIP-2 project to end extreme poverty and promote shared prosperity. The part of the Bank's Environmental and Social Policy for investment project financing (WB) sets out the requirement that the Bank must follow regarding projects it supports through Investment Project Financing, including:

- Environmental and social risk classification
- Use and strengthen of project's environmental and social framework
- Environmental and social due diligence
- Special project types
- Environmental and Social Commitment Plan (ESCP)
- Information disclosure
- Consultation and participation
- Monitoring and implementation support.
- Grievance mechanism and accountability

On the other hand, the following set of standards is requirements for CEIP- 2 to abide by:

- Environmental and Social Standard 1: Assessment and Management of Environmental and Social Risks and Impacts;
- Environmental and Social Standard 2: Labor and Working Conditions;
- Environmental and Social Standard 3: Resource Efficiency and Pollution Prevention and Management;
- Environmental and Social Standard 4: Community Health and Safety;
- Environmental and Social Standard 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement;
- Environmental and Social Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
- Environmental and Social Standard 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities;
- Environmental and Social Standard 8: Cultural Heritage;
- Environmental and Social Standard 9: Financial Intermediaries; and
- Environmental and Social Standard 10: Stakeholder Engagement and Information Disclosure.

2.3 Application of WB ESSs

The major environmental and social impacts of the CEIP- 2 Project are expected to occur during the implementation stage. Some of the key impacts include- a poor working environment, risks regarding community health and safety, noise and dust pollution, waste generation during construction works and mismanagement at the site, displacement of squatters living along the

embankments, gender-based violence, etc. The risks and impacts may arise due to construction/ renovation works within the existing footprints.

All ten ESSs will be applicable for the CEIP- 2 except ESS 9: Financial Intermediaries due to irrelevancy to the project. The application of the ESSs and their relevance to the project have been described in the following table 2-1.

Table 2-1: WB ESS requirements and relevance to the CEIP-2 project

World Bank ESS Policy, Standards, Directive	Objectives	Requirements	Relevance CEIP-2 project
ESS-1 Assessment and Management of Environmental and Social Risks and Impacts	Identify, assess, evaluate, and manage the environmental and social risks and impacts consistent with the ESS. Adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and they are not poor in sharing development benefits and opportunities	E&S risk and impacts should be considered in the environmental and social assessment. The use and strengthening of the Borrower's environmental and social framework for assessing, developing, and implementing World Bank-financed projects.	E&S risks and Impacts have been preliminarily identified based on consultations with primary stakeholders, including communities, Civil society, local government—NGOs, and implementing agencies. Detailed ESIA and ESMP will be prepared in addition to this ESMF, where required.
ESS-2 Labor-and-Working-Conditions	Assess the risks of labor and working conditions because a large influx of labor is likely due to the scale of the proposed project. Consequently, social issues such as conflicts, crime, and Gender-Based Violence (GBV) may occur.	Bangladesh Labour Act, 2006 will guide the labor issues of this project, especially the employer's extent of responsibility and workers' extent of the right to get compensation in case of injury by accident while working. Besides, the project needs to develop a grievance redress system and a Gender Action Plan (GAP) to tackle GBV	CEIP- 2 is a large project, and that's why the project will need many laborers to construct/repair the embankment. During construction GBV, conflict among each other and injury may occur. The project is careful and prepares a labor guide and GAP to tackle these issues effectively.
ESS-3 Resource-Efficiency-and-Pollution-Prevention-and-Management	Promote the sustainable use of resources, including energy, water, and raw materials. Requires technically and financially feasible measures to	Requirements for managing wastes, chemical and hazardous materials, and provisions address historical pollution. Requiring an estimate of gross greenhouse gas emissions resulting from the project (unless minor) was	Concerning Resource Efficiency, the project and the ESA process will identify feasible measures for efficient (a) energy use; (b) water usage and management to minimize water usage during construction/ renovation, conservation

World Bank ESS Policy, Standards, Directive	Objectives	Requirements	Relevance CEIP-2 project
	improve efficient energy consumption, water, and raw materials and introduces specific requirements for water efficiency where a project has high water demand. Avoid or minimize adverse impacts on human health and the environment caused by pollution from project activities. Avoid or mitigate project-related emissions of short and long-lived climate pollutants. Avoid or reduce the generation of hazardous and non-hazardous waste. Minimize and manage the risks and impacts associated with pesticide use.	technically and financially feasible. ESS-3 refers to national law and Good International Industry Practice, in the first instance, the World Bank Groups' EHSGs.	efforts to offset total construction water demand and maintain balance for the demand of water resources; and (c) raw materials use by exploring local materials, recycled aggregates, and innovative technology to minimize the project's footprints on finite natural resources. Concerning Pollution Management, based on past similar project experiences by BWDB and other IAs, the project will develop, as part of the ESA process, prevention and management measures to offset risks and impacts of pollution from potential sources such as dust and emission from the operation of hot-mix and batching plants, crushers, construction, and haulage vehicles, material and spoil stockpile; effluents and wastewater from labor camps, construction camps; spillage or leakage during handling of chemical admixtures, hazardous materials like high strength diesel, used oil, battery wastes, etc., during the project implementation period.
ESS-4 Community-Health-and-Safety	To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle	ESS4 addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of the project	The project will ensure the health and safety of public health and the proper management and control of water supply and sanitation in project areas. The project will

World Bank ESS Policy, Standards, Directive	Objectives	Requirements	Relevance CEIP-2 project
	from both routine and nonroutine circumstances.	to avoid or minimize such risks and impacts, with particular attention to people who may be vulnerable because of their specific circumstances.	construct water supply and sanitation facilities in the project areas to mitigate health and safety risks
ESS-5 Land-Acquisition-Restrictions-on-Land-Use-and-Involuntary-Resettlement	To avoid involuntary resettlement or, when unavoidable, minimize involuntary resettlement by exploring project design alternatives. • To mitigate unavoidable adverse social and economic impacts from land acquisition or restrictions on land, providing timely compensation for loss of assets at replacement	Land rights or land use rights acquired or restricted through negotiated settlements with property owners or those with legal rights to the land if failure to settle would have resulted in expropriation or other compulsory procedures. Restrictions on land use and access to natural resources cause communities or groups to lose resource usage with traditional or customary tenure or recognizable usage rights.	The project will follow the ARIPA 2017 as a guide to acquiring private land and CPRs and ensuring lawful compensation for each PAP. The project will carry out a census, Iol, and socio-economic survey to identify losses and damage to PAPs and provide resettlement support.
ESS-6 Biodiversity-Conservation	Protect and conserve biodiversity and habitats; Apply the mitigation hierarchy and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity; Promote the sustainable management of living	-Implement requirements for projects affecting areas that are legally protected, designated for protection, or regionally/ internationally recognized to be of high biodiversity value. -Implement requirements for sustainable management of living natural resources, including primary production and harvesting, distinguishing between small-scale and	The coastal zone has various natural resources, including coastal fisheries, shrimp, forests, salt, and minerals. Several ecosystems like the mangrove ecosystem – Sundarban- including the estuaries and brackish ecosystems, have important conservation values. These ecosystems are not only biodiversity hotspots, but they also provide the ecological foundation for an important common property resource - the fisheries and biological diversity

World Bank ESS Policy, Standards, Directive	Objectives	Requirements	Relevance CEIP-2 project
	natural resources; Support livelihoods of local communities, including Indigenous Peoples, and inclusive economic development by adopting practices that integrate conservation needs and development priorities.	commercial activities. Implement requirements relating to direct suppliers, where a project purchases natural resource commodities, including food, timber, and fiber.	of the Bay of Bengal (BOB). Key near-shore ecosystems such as seagrass meadows, marshes, and mangroves are particularly valued for their extremely high productivity and diversity of fish and shrimp, oysters, crabs, and other invertebrates. Coastal estuaries and marine ecosystems are cited to support these areas' protection and conservation. The mangrove ecosystem is directly linked with the enhanced productivity of the nursery ground for marine fish and shellfish fauna and protection from tidal surges and cyclones. The coastal mudflats are the hidden treasures of biological diversity. Every year more than one hundred thousand birds visit these mudflats to feed on the invisible life that flourishes on mud, silt, and clay found in Intertidal areas. These areas generally support a range of invertebrates, which are extremely productive Biologically such as benthic organisms, mollusks, crustaceans, and marine worms. Biodiversity conservation is a high impact on coastal belt polder development projects. However, site clearance activities for polder constructions/rehabilitation may involve

World Bank ESS Policy, Standards, Directive	Objectives	Requirements	Relevance CEIP-2 project
			removing vegetation and felling trees on, and temporary disturbance of homestead wild animals. If triggered in any intervention site during the implementation, the project will prepare a site-specific plantation plan, Biodiversity Management, and Conservation Plan.
ESS-7 Indigenous-Peoples	To ensure that the project implementation process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods of Indigenous Peoples. To improve project design and promote local support by establishing and maintaining an ongoing relationship based on meaningful consultation with the Indigenous Peoples affected by the project throughout the project's life cycle	In this ESS, the term "Indigenous Peoples are Traditional Local Communities" (or as they may be referred to in the national context using an alternative terminology) is used in a generic sense to refer exclusively to a distinct social and cultural group possessing the following characteristics in varying degrees ESS7 contributes to poverty reduction and sustainable development by ensuring that projects supported by the Bank enhance opportunities for Indigenous Peoples to participate in and benefit from the project in ways that do not threaten their unique cultural identities and well-being.	The project will assess the nature and degree of the expected direct and indirect economic, social, cultural (including cultural heritage), and environmental impacts on Indigenous Peoples present in, or have a collective attachment to, the project area. The project will prepare a consultation strategy and identify how Indigenous Peoples will participate in project design and implementation. The project will prepare a time-bound plan, such as an Indigenous Peoples plan setting out the measures or actions proposed
ESS-8 Cultural-Heritage	To protect cultural heritage from the adverse impacts of project activities and support its preservation.	The project will avoid effects on cultural heritage. Through the environmental and social assessment, the project will determine the potential risks and	The project will implement globally recognized practices for field-based study, documentation, and protection of cultural heritage in connection with the project.

World Bank ESS Policy, Standards, Directive	Objectives	Requirements	Relevance CEIP-2 project
	To promote meaningful consultation with stakeholders regarding cultural heritage.	impacts of the project's proposed activities on cultural heritage. When avoidance of impacts is not possible, the project will identify and implement measures to address the effects on cultural heritage by the mitigation hierarchy.	The project will identify, following ESS10, stakeholders that are relevant to the cultural heritage that is known to exist or is likely to be encountered during the project life cycle.
ESS-9 Financial-Intermediaries	Sets out how Financial Intermediaries (FI) will assess and manage environmental and social risks and impacts associated with the subprojects it finances. Promote good environmental and social management practices in the subprojects the FI finance. Promote good environmental and sound human resources management within the FI.	Financial Intermediaries (FIs) to have an Environmental and Social Management System (ESMS) - a system for identifying, assessing, managing, and monitoring the environmental and social risks and impacts of FI projects on an ongoing basis. FI to develop a categorization system for all subprojects, with special provisions for subprojects categorized as high or substantial risk. FI borrowers to conduct stakeholder engagement in a manner proportionate to the risks and impacts of the FI subprojects.	Not relevant as there is no financial intermediary involved.
ESS-10 Stakeholder-Engagement-and-Information-Disclosure	Establish a systematic approach to stakeholder engagement that will help Borrowers identify stakeholders and build and maintain a constructive relationship with them, in	Preparation and implementation of a Stakeholder Engagement Plan (SEP). The SEP involves early identification of stakeholders, both project-affected parties and other interested parties, and clarifying how effective engagement occurs. Stakeholder	The project will engage in meaningful consultations with all stakeholders. The project will provide stakeholders with timely, relevant, and accessible information and consult with them culturally appropriately, free of manipulation, interference, coercion, discrimination, and intimidation. The project

World Bank ESS Policy, Standards, Directive	Objectives	Requirements	Relevance CEIP-2 project
	particular, project-affected parties; Assess the level of stakeholder interest and support for the project and enable stakeholders' views to be taken into account in project design and environmental and social performance; Ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format; Provide project-affected parties with accessible and inclusive means to raise issues and grievances and allow Borrowers to respond to and manage such grievances.	engagement is to be conducted in a manner proportionate to the project's nature, scale, risks, and impacts and appropriate to stakeholders' interests. Specifies what is required for information disclosure and to achieve meaningful consultation.	will ensure their spontaneous participation in project implementation.

2.4 Other Frameworks

2.4.1 Applicable International Treaties Signed by the GoB

Bangladesh has signed most international treaties, conventions, and protocols on the environment, pollution control, biodiversity conservation, and climate change, including the RAMSAR Convention, the Bonn Convention on Migratory Birds, and the Rio de Janeiro Convention on Biodiversity Conservation, and the Kyoto Protocol on Climate Change. A list of the relevant international treaties signed by GoB is furnished below:

- Ramsar Convention
- Protection of birds (Paris)
- Protocol on Waterfowl Habitat
- World Cultural and Natural Heritage (Paris)
- Bonn Convention
- Prevention and Control of Occupational hazards
- Occupational hazards due to air pollution, noise & vibration (Geneva)
- Occupational safety and health in the working environment (Geneva)
- Occupational Health services
- Convention on oil pollution damage (Brussels)
- Civil liability on the transport of dangerous goods (Geneva)
- Safety in the use of chemicals during work
- Convention on oil pollution
- UN framework convention on climate change (Rio de Janeiro)
- Convention on Biological Diversity (Rio de Janeiro)
- International Convention on Climate Changes (Kyoto Protocol)
- Indigenous and Tribal Populations Convention
- ILO Convention No 29 on Forced Labour
- ILO Convention no. 182 on Prohibition and Immediate Action for the Elimination of the Worst Forms of Child Labour
- Migrant Workers (Supplementary Provisions) Convention
- Convention on the Elimination of All Forms of Discrimination Against Women
- International Covenant on Economic, Social and Cultural Rights (ICESCR)

2.4.2 Gap Analysis of World Bank Requirements and National Laws

Institutional legal mandates for land-based developments and national land acquisition and management laws govern infrastructure development and public and private lands. There are some gaps between the existing land acquisition law of the country and WB ESSs on Involuntary Resettlement and indigenous peoples in terms of identifying affected persons and compensation packages and participation of community groups of diverse interests and vulnerabilities. Gaps between GoB LA law (new Act 21 of 2017), including policies related to small ethnic communities and suggested gap-filling measures, are given in Table 2-2 below.

Table 2-2: Gaps between GoB laws and World Bank ESSs (Ref. Table 3/Capacity Assessment Bangladesh/WB)

WB ESS Standard	Gaps
ESS1: Assessment and Management of Environmental and Social Impacts and Risks	(i) ESIA study screening and scoping do not guarantee coverage of all ESS standards in the assessment. (ii) The stakeholder engagement during the conduct of the ESIA is limited, and the ESIA report is not disclosed. (iii) The ESIA system in Bangladesh does not require an analysis of alternatives.
ESS2: Labor and Working Conditions	(i) The Labor Act does not specifically require that development be assessed and reviewed in labor and working conditions, including OHS requirements, before approval. (ii) The Labor Act does not require development projects to prepare Labor-Management Plans/Procedure or OHS Plan.
ESS3: Resource Efficiency and Pollution Prevention and Management	Existing energy and water conservation policies, laws, and regulations do not require development projects to assess and incorporate resource efficiency measures in their ES risk management plans.
ESS4: Community Health and Safety	Covered under ESIA, but the systems do not provide clear requirements for the development project and implementation. Health issues are within the purview of MHFW, but it is currently not involved in project preparation and oversight.
ESS5: Land Acquisition, Land Use Restriction, and Involuntary Resettlement	Bangladesh: ARIPA (i) does not require the preparation of RAP; (ii) does not provide compensation or assistance to those who do not have a formal legal claim to the land; (iii) does not provide transitional allowances for restoration of livelihoods for informal settlers; (iv) relies on cash compensation, no developmental objectives; (v) no provision to give special attention to the vulnerable groups (vi) valuation of lost asset is not based on "replacement cost' standard
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	No equivalent requirements on (i) the application of the hierarchy of measures; (ii) the preparation of the Biodiversity Management Plan; (iii) differentiated measures on types of habitats; (iii) conduct of due diligence on primary suppliers.

WB ESS Standard	Gaps
ESS7: Indigenous People	No equivalent requirements on (i) coverage of IP impacts in the ESIA; (ii) special treatment or differentiated approach to IPs and vulnerable groups; (iii) conduct of FPIC; (iv) development of IP Plan.
ESS8: Cultural Heritage	No equivalent requirements are (i) the application of the hierarchy of measures; (ii) the development of a Cultural Heritage Management Plan; (iii) the development and adoption of project-specific Change Find Procedures; and (iv) the engagement of cultural heritage experts.
ESS9: Financial Intermediaries	Not applicable to the country system. Project proponents, regardless of funders, are subject to the same country's laws.
ESS10: Stakeholder Engagement and Information Disclosure	The ECA/ECR does not specifically require consultation, but the ESIA guidelines issued by DOE and other agencies recommend public consultations during scoping and the preparation of the ESIA. There is also no provision for any stakeholder engagements during project implementation

2.5 Application of GoB Policies, Acts, and Rules on CEIP-2 Components and their Classification

Key environmental and social risks and impacts of the CEIP-2 project are anticipated to occur during the implementation stage. The project is classified as a "High Risk" project due to the complexity of environmental issues associated with project activities involving major civil works by reconstruction and rehabilitation of the coastal embankment to protect against tidal flooding and storm surges due to climate change. Since the coastal area is of high ecological sensitivity and vulnerability, certain negative environmental impacts may occur during the implementation and operational phase of the overall polder system. There may be a localized impact on the natural habitats, especially on the fish spawning site and protected areas, during the implementation of the civil works. Sundarbans, the largest Mangrove Forest of South Asia, is close to the four districts of 15 polders. Rehabilitation and reconstruction of polders may indirectly impact the water flow quantity and pattern within the channels of Sundarbans. All ESSs will be applicable in the polder development, except the ESS 9: Financial Intermediaries.

The legislation relevant for environmental assessment for polder components is the Environmental Conservation Act 1995 (ECA'95) and the Environmental Conservation Rules 1997 (ECR'97). Article-12 of Environment Conservation Act '1995, the key act governing environmental protection in Bangladesh, states that 'No industrial unit or project shall be established or undertaken without obtaining, in the manner prescribed by rules, an Environmental Clearance Certificate from the Director General (of Department of Environment, DoE)' and one of the key procedures to obtain the Environmental Clearance Certificate is to undertake an effective and expert environmental assessment.

The Department of Environment (DoE), the technical arm of the Ministry of Environment, Forests and Climate Change (MoEFCC), is the regulatory body and the enforcement agency of all environmental-related activities. It is the responsibility of the PIU/BWDB to conduct IEE/ESIA of the project activities; the responsibility to review IEE/ESIA to issue an Environmental Clearance Certificate rests on DoE. This assessment might be a screening and categorization, an IEE, or a comprehensive ESIA. Like all other projects, this project also needs to meet the requirement of the DoE. The procedures for the "Red" Category include submission of:

- An Initial Environmental Examination (IEE)
- An Environmental and Social Impact Assessment (ESIA)
- An Environmental and Social Management Plan (ESMP)
- No Objection Certificate of the Local Authority
- Emergency Plan relating adverse environmental impact and mitigation
- Outline of Relocation, Rehabilitation plan

Environment clearance must be obtained by the respective implementing agency or project proponent (private sector) from the Department of Environment (DoE). The environmental clearance procedure for Red Category projects can be summarized as follows:

Steps to be followed for obtaining Environmental Clearance Certificate (ECC) in connection with the construction/ reconstruction from DoE are outlined in Figure 2.1. Public participation or consultation is not a condition in the ECR '97 and or IEE/EIA Guidelines. However, DoE prefers the proponent to engage in public participation and put needs while providing site clearance or during the approval of the ESIA ToR.

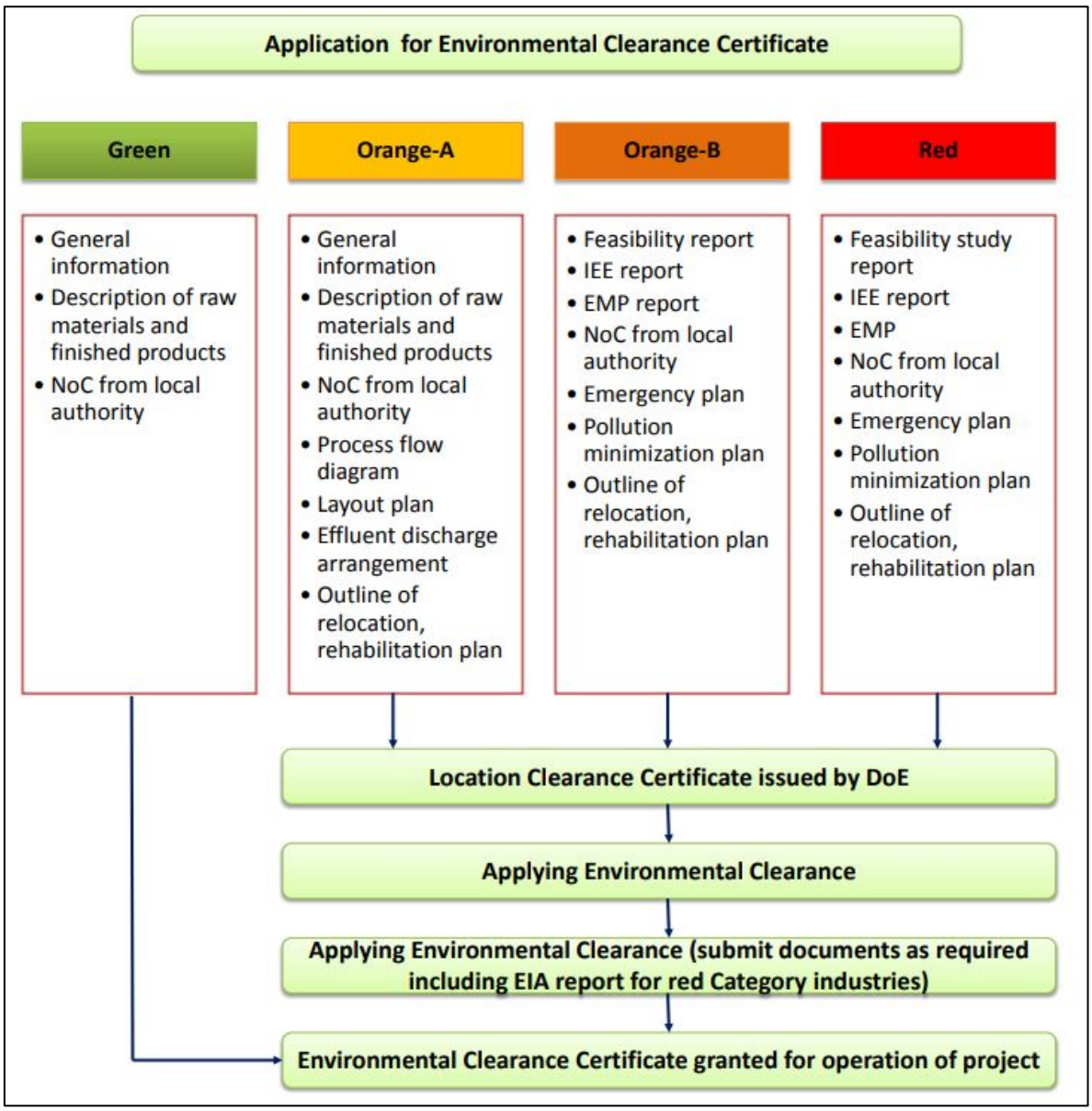

Figure 2-1: Process of Obtaining the Clearance Certificate from DoE

3. ENVIRONMENTAL AND SOCIAL ASSESSMENT PROCEDURES

3.1 Environmental Assessment Studies

This chapter provides an overview of the sequential methodological steps to be followed in each assessment exercise related to the environmental impacts that are likely to occur in the construction, rehabilitation, and maintenance of the CEIP-2 under BWDB.

3.2 Key Activities of the ESIA under CEIP-2

Steps in Project Life cycle	Steps in the Environmental and Social Assessment Process
Project Identification	**Environmental Screening:** We need to decide on further needs for an Initial Environmental Examination (IEE) or a full Environmental and Social Impact Assessment (ESIA)
	Environmental Scoping: identify significant potential impacts and project alternatives
	Initial Environmental Examination (IEE): basic impact assessment, findings, and recommendations incorporated into the design.
Feasibility Study	**Baseline Data Collection:** Collect measurements of different environmental parameters to identify current environmental conditions related to the proposed project and predict the future condition
	Environmental Impacts Identification: Predict and identify impacts in terms of characteristics such as magnitude, extent, and duration in quantitative terms, including analyzing potential cumulative/effects induced. Assess also alternatives, including preferred and 'no action' options.
Environmental and Social Assessment	**Develop Management & Mitigation Measures:** Identifies how to avoid, reduce and minimize adverse impacts and enhance beneficial impacts (prepare an ESMP matrix and cost proposed actions).
	Public Consultation and Participation: to be conducted at various stages in the assessment process to ensure quality, comprehensiveness, and effectiveness and that stakeholders' views are adequately followed up.
	Environmental Assessment Report: Summarizes all information obtained, analyzed, and interpreted in a report form suggested by the approving authorities.
Project Appraisal/ Approval	**Review and Approval of the Report:** Review of ESIA report to assess if all possible issues have been adequately addressed and to facilitate the decision-making process; decide if the project should proceed or if further alternatives must be explored
Implementation Plan	**Environmental Management Plan:** determines specific actions to take during engineering design, construction, and operational and maintenance stages to minimize or mitigate impacts and to address cumulative/induced impacts
Engineering Design and Construction of works	**Environmental Monitoring:** determines compliance with ESMP and impacts. Monitoring also includes effect monitoring on the physical, biological and social environment, measured by objectively verifiable

	indicators described in the ESMP. This section must define schedules and respective responsibilities for monitoring and supervision activities.
Post-construction activities and audit	**Environmental Audit:** An independent/third-party/consulting firm conducted immediately after construction and two years later to come forward with recommendations to be followed up by pre-identified line agencies.

3.3 Environmental and Social Impact Assessment (ESIA) Procedure

The ESIA is a generally accepted planning tool as an integral component of sound decision-making. The purpose of the ESIA is to give the environment and its surrounding community its due importance in the decision-making process by clearly evaluating the environmental and social consequences of the proposed study before action is taken. BWDB will use the ESIA as a decision-making tool to ensure that the project activities and design are environmentally sound and sustainable. In the preparation phase, the ESIA shall achieve the following objectives:

- To establish the environmental and social baseline in the project area and to identify the significant environmental issues;
- To assess the impacts and provide for measures to address the negative impacts by the provision of the requisite avoidance, mitigation and compensation measures;
- To integrate the environmental issues in the project planning and design;
- To develop appropriate management plans for implementing, monitoring, and reporting the suggested environmental mitigation and enhancement measures.

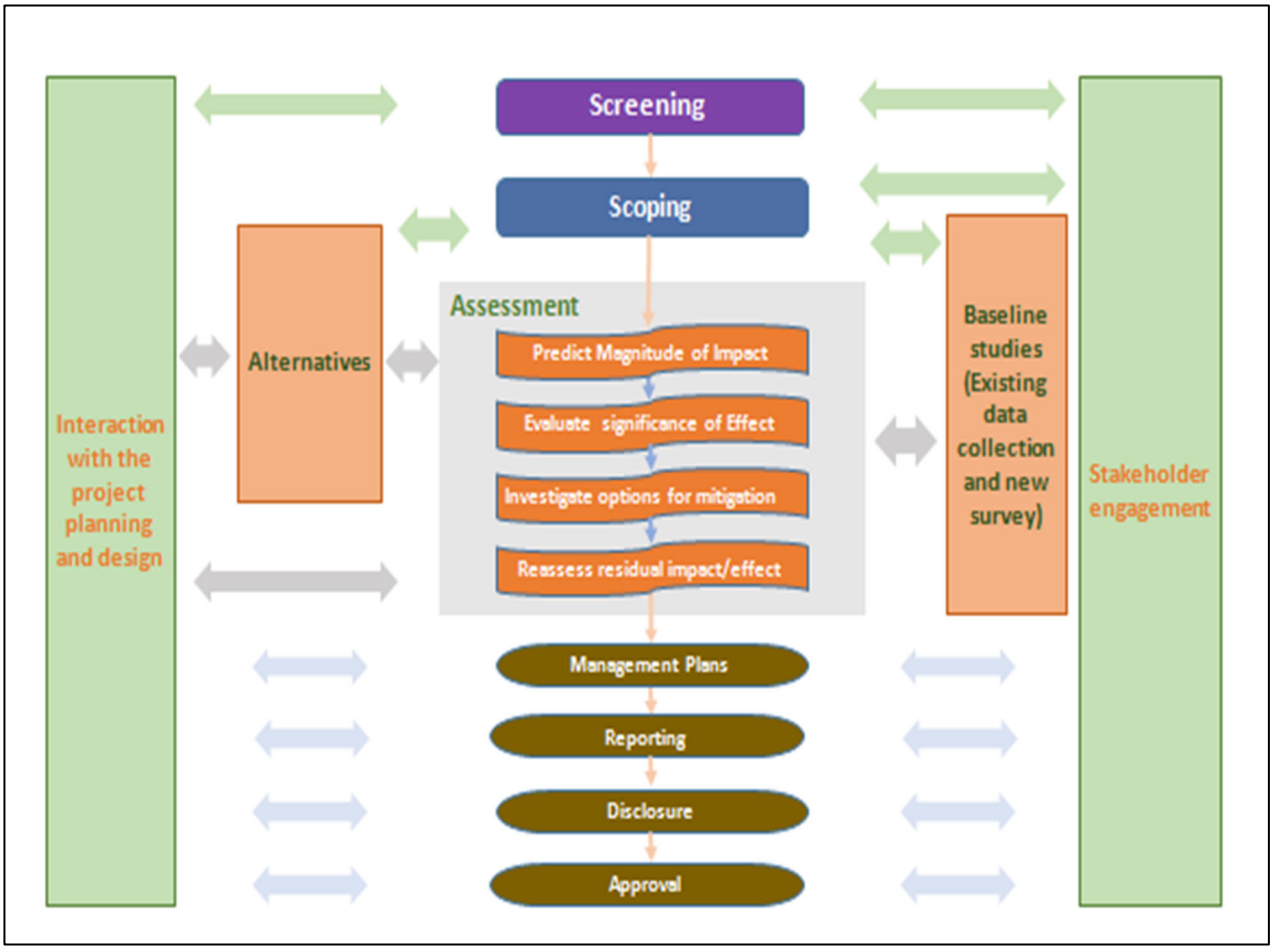

Figure 3-1: Impact Assessment Process / Framework

Screening and Scoping

Environmental screening identifies the consequence of the proposed projects in a broader sense based on similar project experiences, stakeholders' perceptions, and expert judgment without much detailed investigation. Critical issues are also identified through the screening, which needs thorough investigation. The scoping exercise for ESIA involves presenting more detailed background data and a comprehensive public consultation and notification process that should also include a workshop to be held at that stage. The further environmental impact assessment will be taken based on the extent of environmental impacts obtained from the environmental screening and scoping.

However, the common approach proposed in donor's guidelines is to deal on a case-by-case basis. The BWDB will follow the legal provision given by the WB guidelines to obtain the ESIA study's approval.

Project Influence Area (PIA)

The project influence area will be broadly demarcated during the screening and scoping stage. Establishing a project influence area requires considering and evaluating the activities to be carried out and processes that would take place during the pre-construction, construction, and operational phase.

Baseline Information/Data Collection

Following baseline information/data will be required from various aspects:

- Physical Environment: climate/meteorology, physiography, topography, geology, geomorphology, soil type and quality, sediment quality, land use, ambient air quality, noise level, vibration level, surface and groundwater quality, seismicity, drainage and hydrology, flood pattern, cyclone pattern, unstable and erosion-prone areas, siltation, etc.

- Biological Environment: bio-ecological zones of Bangladesh, ecologically sensitive areas (protected areas, reserve forests, eco-parks, wetlands), flora and faunal species diversity, rare and threatened species, human uses of natural resources.

- Socioeconomic Environment: demographic features, infrastructure, utilities, business, trade, community properties, agricultural and other livelihood, gender issues, indigenous and vulnerable groups, current forms of settlement, and trade structures.

Source and methodology of both primary and secondary baseline data collection on water resources, land resources, agriculture, livestock, fishery, ecosystems, and socio-economic resources are presented in the following sections-

Water Resources

Water resource data in connection with river hydrology, river morphology, surface, and groundwater availability, drainage pattern, ground and surface water quality, and water use have been collected from secondary sources and primary data collection and analysis as well as observations by the professionals of the multi-disciplinary team backed up by feedback from the local people during field visits to the Project area. Major river systems are identified for hydrological and morphological investigation through historical and current data collection and analysis. Specific areas or points of interest selected for collecting data are special hydrological and morphological aspects, water availability, drainage pattern, water quality (surface and groundwater), flash flood, risk of erosion, and sedimentation.

Meteorology

Meteorological data for selected stations will be collected from the National Water Resources Database (NWRD) of the Water Resources Planning Organization (WARPO), which contains long series of temporal data showing daily values for meteorological stations maintained by the Bangladesh Meteorological Department (BMD).

Topography

The topographical data will be collected from the Geological Survey of Bangladesh (GSB) and NWRD.

Land Resources

The agro-ecological region of the project area will be identified using secondary sources, including Food and Agriculture Organization (FAO) and United Nations Development Program (UNDP). The land type and soil texture data will be collected from the Upazila Land and Soil Resources Utilization Guide of the Soils Resources Development Institute (SRDI). The secondary data of these parameters will be verified later at the field level through physical observations and consultations with the local people and officials of the Department of Agriculture Extension (DAE) during the field visit. With field verification, land use information and maps will be prepared from satellite image classification.

Agricultural Resources

Data on agricultural resources that include existing cropping patterns, crop variety, crop calendar, crop yield, crop damage, and agricultural input will be collected from secondary and primary sources. Agriculture data will be collected through extensive field surveys with the help of questionnaires and consultations with local people and concerned agricultural officials and from secondary sources from the DAE.

Livestock Resources

Data on the present status of livestock (cow/bullock, buffalo, goat, and sheep) and poultry (duck and chicken) in the polder area will be collected during a field survey in consultation with the local people through participatory rural assessment (PRA) and rapid rural assessment (RRA) as well as from secondary sources from Upazila Livestock Office.

Fish and Fisheries

Primary data will be collected from the fisher's community, households, and local key informants, while secondary data will be collected from Upazila Fisheries Offices (UFOs) during field visits.

Ecological Resources

The land use information on the different ecosystems has already been generated through analysis of recent satellite imagery. Field investigation methods will include physical observations, transect walks, habitat surveys, and consultations with local people.

Social Resources

Demographic information, such as population, occupation and employment, literacy rate, drinking water, sanitation, and electricity facilities, has been collected from secondary sources. Data on income, expenditure, land ownership pattern, self-assessed poverty status, migration, social overhead capitals and quality of life, disasters, conflicts in the study area, information on non-governmental organizations (NGOs), cultural and heritage features of the project area will be collected mainly from primary sources through PRA and FGDs and public consultations.

- **Impact Assessment**

The assessment of effects and identification of residual impacts considers any incorporated mitigation measures adopted due to any anticipated potential implications of Project activities. It will depend largely on the extent and duration of change, the number of people or the size of the resource affected, and their sensitivity to the change. Potential impacts can be negative and positive (beneficial), and the methodology defined below will be applied to determine possible beneficial and adverse effects.

The criteria for determining significance are generally specific for each environmental and social aspect. Still, the magnitude of each potential impact is usually defined along with the receptor's sensitivity. Generic criteria for determining magnitude and sensitivity used for the Project are summarized below:

Impact Magnitude

The assessment of magnitude shall be undertaken in two steps. Firstly, the key issues associated with the CEIP-2 project are beneficial or adverse. Secondly, potential impacts shall be categorized as Very High, High, Moderate, and Low based on consideration of the parameters such as:

Duration of the potential impact:

- The spatial extent of the potential impact;
- Reversibility;
- Likelihood; and
- Legal standards and established professional criteria.

The magnitude of potential impacts of the project shall be identified according to the categories outlined in **Table 4-1**.

Table 3-1: Parameters for Determining Magnitude

Parameter	Very High	High	Moderate	Low/Nil
Duration of the potential impact	Long term (more than 35 years)	Medium Term Lifespan of the Project (5 to 15 years)	Less than project lifespan	Temporary with no detectable potential impact
The spatial extent of the potential impact	Widespread far beyond project boundaries	Beyond immediate Project components, site boundaries or local area	Within project boundary	A specific location within project component or site boundaries with no detectable potential impact
Reversibility of potential impacts	The potential impact is effectively permanent, requiring considerable intervention to return to baseline	Potential impact requires a year or so with some interventions to return to baseline	Baseline returns Naturally or with limited intervention	Baseline remains constant

Parameter	Very High	High	Moderate	Low/Nil
			within a few months	
Legal standards and established professional criteria	Breaches national standards and or international guidelines/obligations	Complies with limits given in national standards but breaches international lender guidelines in one or more parameters	Meets minimum national standard limits or international guidelines	Not applicable
Likelihood of potential impacts occurring	Occurs under typical Operating or construction conditions (Certain)	Occurs under worst-case (negative impact) or best case (positive impact) operating conditions (Likely)	Occurs under abnormal, exceptional, or emergency conditions (occasional)	Unlikely to occur

Sensitivity of Receptor

The receptor's sensitivity shall be determined based on the review of the population (including proximity/numbers/vulnerability) and the presence of features on the site or the surrounding area. Criteria for determining receptor sensitivity of the project's potential impacts are outlined in Table 3-2.

Table 3-2: Criteria for Determining Sensitivity

Sensitivity Determination	Definition
Very Severe	The vulnerable receptor with little or no capacity to absorb proposed changes or minimal opportunities for mitigation
Severe	The vulnerable receptor with little or no capacity to absorb proposed changes or limited opportunities for mitigation
Mild	The vulnerable receptor with some capacity to absorb proposed changes or moderate opportunities for mitigation
Low/Negligible	The vulnerable receptor with good capacity to absorb proposed changes or/and good opportunities for mitigation

Risk Classification (ESS1)

Environmental and social risk classification takes into account relevant potential risks and impacts, such as:

- the type, location, sensitivity, and scale of the Project, including the physical considerations of the Project; kind of infrastructure (e.g., dams and reservoirs, power plants, airports, major roads); volume of hazardous waste management and disposal;

- the nature and magnitude of the potential E&S risks and impacts, including impacts on greenfield sites; impacts on brownfield sites (e.g., rehabilitation, maintenance, or upgrading activities); the nature of the potential risks and impacts (e.g., whether they are irreversible, unprecedented or complex); resettlement activities; presence of Indigenous Peoples; and possible mitigation measures considering the mitigation hierarchy;
- the capacity and commitment of the Borrower to manage such risks and impacts in a manner consistent with the ESSs, including the country's policy, legal and institutional framework; laws, regulations, rules, and procedures applicable to the Project sector, including regional and local requirements; the technical and institutional capacity of the Borrower; the Borrower's track record of past Project implementation; and the financial and human resources available for management of the Project;
- other areas of risk that may be relevant to the delivery of E&S mitigation measures and outcomes, depending on the specific Project and the context in which it is being developed, including the nature of the mitigation and technology being proposed, considerations relating to domestic and regional stability, conflict or security.

High Risk:

A Project is classified as High Risk after considering, in an integrated manner, the risks and impacts of the Project, taking into account the following, as applicable.

a. The Project is likely to generate a wide range of significant adverse risks and impacts on human populations or the environment. This could be because of the complex nature of the Project, the scale (large to very large), or the sensitivity of the location(s) of the Project. This would take into account whether the potential risks and impacts associated with the Project have the majority or all of the following characteristics:
    - long term, permanent and irreversible (e.g., loss of major natural habitat or conversion of wetland), and impossible to avoid entirely due to the nature of the Project;
    - high in magnitude and spatial extent (the geographical area or size of the population likely to be affected is large to very large);
    - significant adverse cumulative impacts;
    - significant negative transboundary impacts; and
    - a high probability of serious adverse effects to human health and the environment (e.g., due to accidents, toxic waste disposal, etc.);
b. The area likely to be affected is of high value and sensitivity, for example, sensitive and valuable ecosystems and habitats (legally protected and internationally recognized places of high biodiversity value), lands or rights of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities and other vulnerable minorities, intensive or complex involuntary resettlement or land acquisition, impacts on cultural heritage or densely populated urban areas.

Substantial Risk:

A Project is classified as Substantial Risk after considering, in an integrated manner, the risks and impacts of the Project, taking into account the following, as applicable.

The Project may not be as complex as High-Risk Projects, its ES scale and impact may be smaller (large to medium), the location may not be in such a highly sensitive area, and some risks and impacts may be significant. This would take into account whether the potential risks and impacts have the majority or all of the following characteristics:

- they are mostly temporary, predictable, and reversible, and the nature of the project does not preclude the possibility of avoiding or reversing them (although substantial investment and time may be required);
- there are concerns that the adverse social impacts of the Project, and the associated mitigation measures, may give rise to a limited degree of social conflict, harm, or risks to human security;
- they are medium in magnitude and in spatial extent (the geographical area and size of the population likely to be affected are medium to large);
- the potential for cumulative and transboundary impacts may exist, but they are less severe and more readily avoided or mitigated than for *High-Risk* Projects; and
- there is a medium to the low probability of serious adverse effects on human health and the environment (e.g., due to accidents, toxic waste disposal, etc.), and there are known and reliable mechanisms available to prevent or minimize such incidents;

The effects of the Project on areas of high value or sensitivity are expected to be lower than in High-Risk Projects.

Moderate Risk:

A project is classified as Moderate Risk after considering, in an integrated manner, the risks and impacts of the Project, taking into account the following, as applicable:

The potential adverse risks and impacts on human populations and the environment are not likely to be significant. This is because the Project is not complex and large, does not involve activities that have a high potential for harming people or the environment, and is located away from environmentally or socially sensitive areas. As such, the potential risks and impacts, and issues are likely to have the following characteristics:

- predictable and expected to be temporary and reversible;
- low in magnitude;
- site-specific, without the likelihood of impacts beyond the actual footprint of the Project; and
- low probability of serious adverse effects to human health and the environment (e.g., do not involve use or disposal of toxic materials, routine safety precautions are expected to be sufficient to prevent accidents, etc.).

The Project's risks and impacts can be easily mitigated predictably.

Low Risk:

A project is classified as Low Risk if its potential adverse risks to and impacts on human populations and the environment are likely to be minimal or negligible. With few or no negative risks and effects and issues, these Projects do not require further ES assessment following the initial screening.

Assigning Significance (ESS1: High Risk, Substantial Risk, Moderate Risk, and Low Risk)

Following the magnitude assessment, the quality and sensitivity of the receiving environment receptor shall be determined. The significance of each potential impact will be established using the potential impact significance matrix shown in Table 3.3 and in accordance with the ESS1 standard of the possible four risk categories, viz—high, Substantial, Moderate, and Low.

Table 3-3: Assessment of Potential Impact Significance (ESS1)

The magnitude of the Potential impact	Sensitivity of Receptors			
	Very Severe	Severe	Mild	Low / Negligible
Very High	High	High	Substantial	Moderate
High	High	Substantial	Substantial	Negligible
Moderate	Moderate	Moderate	Negligible	Negligible
Low/Nil	Negligible	Negligible	Negligible	Negligible

Mitigation Measures

After the impact assessment discussed above, appropriate mitigation measures have been proposed to avoid, offset, mitigate/reduce, or compensate for the identified impacts. Generally, impacts having moderate to critical consequence significance per **Table 4-3** require appropriate avoidance/ mitigation/compensatory measures to reduce the significance. Impacts with negligible significance can be left alone, not needing mitigation measures.

Generally, preference is given to avoiding the impact with the help of options available for nature, siting, timing, method/procedure, or scale of any Project activity. If avoidance is not possible, appropriate mitigation and control measures are proposed to reduce the consequence significance of the predicted impact. Finally, if impact reduction is not possible, compensatory measures are proposed.

From the literature review, expert judgment and consultation with stakeholders will identify possible enhancement and mitigating measures for beneficial and adverse effects, respectively.

Preparation of Environmental Management and Monitoring Plan

An environmental and social management plan (ESMP) for the proposed Project will be prepared to comprise the mitigation/ enhancement measures with institutional responsibilities, environmental monitoring plan, training and capacity building plan, and reporting and documentation protocols.

4. POTENTIAL ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

4.1 Environmental Risks and Impacts

The overall impact assessment of the proposed project activities CEIP-2 to be implemented reveals that most of the likely adverse impacts could be minimized or eliminated by adopting standard mitigation measures. There is also scope to enhance some of the beneficial effects generated from the proposed project.

The potential impacts of the CEIP-2 on the key environmental and social parameters identified as part of the ESMF have also been analyzed according to the ESS1 risk categories based on the significance of each impact.

The ESIA study should modify and further detail this analysis based on professional judgment and public consultations. A preliminary categorization of the project components/sub-components based on their environmental assessment.

This section discusses the guideline to predict the potential and mostly typical impacts on the polder influence area's key environmental and social parameters based on the overall baseline, polder components' assessment, and the activities' primary assessment.

The potential impacts will be identified during various stages of the project activities: pre-construction, construction, and operation. The environmental impacts identified at this stage are preliminary. They will need to be further analyzed specifically activity-wise, and the potential for occurrence has to be ascertained during ESIA and preparation of the ESMPs.

4.1.1 Project Preparation Phase

Site-Specific Land Cover and Land Use Changes (ESS 1, 3, 6)

Rehabilitation and refurbishment of facilities, including civil works for renovation, rehabilitation, repairing, and refurbishment of existing facilities, including part of embankments and connecting roads, may slightly change existing land use and land cover at the local level. However, potential negative impacts would be limited on a very small scale within the construction site.

Loss of trees (ESS 6)

Alignment changing of some parts of the polders may require cutting of trees and removal of natural vegetation, though it could be very significant in number.

Loss of aquatic habitat (ESS 1, 3, 6)

Loss of aquatic habitats could happen due to the reconstruction of some damaged polders and roads and pollution from unplanned waste disposal.

Drainage congestion and waterlogging (ESS 1, 3, 4)

Proposed development activities can cause drainage congestion and waterlog in the local area, though at a very small scale, if not properly considered runoff's local drainage.

4.1.2 Project Implementation Phase

Air Pollution (ESS 1, 3, 4, 6)

Reconstruction of polders may generate emissions from construction equipment, other machinery, and construction traffic. The emissions may also include greenhouse gases (GHGs) from engine fuel combustion (exhaust emissions) and evaporation and leaks from

vehicles (fugitive emissions), and emissions from asphalt work. The emissions from construction activities will deteriorate the ambient air quality and affect public health. In addition, dust generated from the above activities will also affect crops and livestock inside the polders.

Noise Pollution (ESS 1, 3, 4)

Noise will be produced by vehicular movement, excavation machinery, concrete mixing, and other construction activities. The schools, religious places, and crowded market areas are particularly vulnerable to the increased noise levels.

Water Pollution (ESS 1, 3, 4, 6)

During the construction phase, activities polders, ponds/canals/water streams-rivers can potentially cause some localized increase in water turbidity. However, this increase in turbidity is not likely to significantly impact overall water quality and the aquatic fauna primarily because of its temporary and localized nature. The construction camps and other site facilities such as offices and warehouses will also generate considerable waste. These effluents can potentially contaminate the drinking water sources of the area and can also be harmful to the natural vegetation, cultivation fields, water bodies, and aquatic flora and fauna. Other possible causes of land or water contamination include accidental leakage or spillage of fuels, oils, chemicals, and waste effluents released from construction sites.

Soil Contamination (ESS 1, 3, 4, 6)

Like water pollution discussed above, soils in the construction area and nearby lands used for agriculture will be prone to pollution from the construction activities, construction yards, workers' camps, and other construction areas. Fuel and hazardous material storage sites and their handling are also potential soil and water pollution sources. Improper sitting, storage, and handling of fuels, lubricants, chemicals, hazardous materials, and potential spills will severely impact the soil and water quality and cause safety and health hazards.

Waste generation (ESS 1, 3, 4, 6, 8)

Some solid wastes will be generated during the construction phase at the construction sites. In addition, some hazardous wastes will also be generated from the construction vehicle maintenance activities. Such waste must be responsibly disposed of to avoid adverse environmental, human health, and aesthetic impacts. Inappropriate disposal of these wastes can lead to soil and water contamination and health hazards for the local communities, livestock, aquatic and terrestrial fauna.

Impacts on aquatic habitat (ESS 1, 3, 6)

The aquatic habitat may be disturbed by interventions like drainage channel re-excavation, channel closure regulator construction, etc., by increasing the water turbidity. However, construction activities are not likely to directly impact terrestrial or aquatic wildlife or their habitat since no sensitive ecological hot spots have been identified at the ESMF stage. However, accidental leakage, spillage of contaminants, or solid waste/debris dumping on land or water bodies can potentially affect these habitats. These can cause injuries and even fatalities to these species.

4.1.3 Post-Project Operational Phase

Potential Changes in Water Courses (Canal) (ESS 1, 3, 6)

The possible development works may need excavation of canals that may include stabilization and deepening of the channel. These changes are mostly positive, likely to occur over time and need to be regularly monitored. Re-excavation will only induce localized bed changes.

Loss of Ecological Connectivity (ESS 1, 6)

Construction of roads and other infrastructures may disconnect local wetland connectivity, negatively impacting fish and other aquatic species' life cycle. That would also potentially impact

Loss of Vegetation (ESS1, 6)

Infrastructures constructed under the proposed project would be the sites of human access, which may lead to the loss of more vegetation (herbs, shrubs, and trees) in the surroundings due to the human footprint.

Generation of Solid Waste (ESS 1, 3, 4)

Solid waste will be generated from the constructed infrastructures' regular operation and maintenance activities. Hazardous waste will also be generated from access road maintenance. If not appropriately disposed of, this waste can contaminate soil and water resources, thus negatively affecting communities and natural habitats.

Air Pollution (ESS 1, 3, 4)

Road traffic will be increased due to the construction of these infrastructures in the project area. Emissions from local road traffic may affect the ambient air quality.

Noise Generation (ESS 1, 3, 4, 8)

During operation, noise levels along the access roads will be increased due to the higher traffic volume and mass people gathering. Traffic noise will be a significant nuisance to sensitive receptors such as schools and religious places close to the roads and the children and aged persons.

Water Pollution (ESS 1, 3, 6)

Generally, paved roads increase impervious surface area, increasing the surface water runoff rate. Increased stormwater flow rates can lead to stream erosion and flooding, causing soil erosion, channel modification, and siltation. During the operation phase, some localized turbidity may occur during any maintenance works of the constructed sites. Similarly, the maintenance works can generate a limited quantity of waste effluents.

4.2 Social Risks and Impacts

4.2.1 Project Preparation Phase

Impacts on Vulnerable and disadvantaged groups/communities/individuals (ESS1)

The CEIP-2 project has been designed to provide holistic support to improve the resilience of vulnerable coastal communities. It aims to increase contribution to environmental sustainability through a set of targeted capacity building activities through govt. And non-govt. Institutions. However, these activities would also risk discrimination against the disadvantaged groups due to misdistribution of resources and misuse of powers.

4.2.2 Project Implementation Phase

Site Clearance and Restoration (ESS 1, 2, 4, 6)

After completing the construction activities, the left-over construction material, debris, spoils, scraps, and other wastes from workshops and campsites can create hindrance and encumbrance for the local communities and block natural drainage and irrigation channels.

Occupational Health and Safety (ESS 1, 2, 4)

Generally, the construction/reconstruction activities may pose health hazards to the workers at the site, such as lifting and handling heavy equipment, operating machinery, electrical equipment, working near water, etc.

Like the above, various construction/renovation/expansion facilities may cause safety issues, including physical injuries and accidental death. This may be increased in the absence of proper training of unskilled workers to be engaged.

Similarly, Covid-19 contamination will be an important risk associated with the workers at the construction/renovation/expansion sites. Govt. imposed Covid-19 health safety protocol for workers, and WHO's Covid 19 safety guidelines should be followed to avoid any risk of spreading the virus among associated families/communities.

Impacts on Livelihoods and Income (ESS 1)

The project components will positively impact enhancing the livelihoods of disadvantaged people, youth, women, laborers and unskilled workers, vulnerable communities, etc. It will contribute to their income generation and poverty reduction.

Involuntary Resettlement Impacts (ESS 5)

The project will not acquire any land, thus having no chance of involuntary acquisition. All works will be carried out within the existing polders. However, the likelihood of infrastructures construction/renovation may involve the displacement of some squatters living on the embankments. For these reasons, and largely as a precautionary measure, the project triggers ESS5 on involuntary resettlement.

Impacts on Indigenous People (ESS 7)

The project includes several capacity development activities. The social risk associated with the CEIP- 2 projects is ensuring culturally appropriate benefits to increase the resilience of the local indigenous group.

Impact on Cultural Heritage (ESS8)

Some mosques, temples, and graves along the projects area may be affected by project works. If they are found by the ESIA to be affected, they will have to be relocated and will be included in the RAP prepared for the program. Chance Find Procedures will be included in the ESMP. The chance finds clause will be included in works contracts requiring contractors to stop construction if cultural heritage is encountered during construction. The project will also have to coordinate closely with the relevant mandated country authority to salvage and restore such cultural heritage.

4.2.3 Post-Project Operational Phase

Impacts on Local Livelihoods (ESS 1, 2)

While effort will be exerted for livelihood improvement of the local targeted communities, some of the project activities may have reversible and mitigable impacts on them. The probable

impacts on income and livelihoods are minor since the project will have no involuntary displacement.

4.3 Potential Mitigation Measures

The potential impacts will be identified during various stages of the project activities: pre-construction, construction, and operation. The environmental impacts identified at this stage are preliminary. They will need to be further analyzed specifically activity-wise, and the potential for occurrence has to be ascertained during ESIA and preparation of the ESMPs.

The ESMF considers the analysis of the overall coastal polder and should be considered for guidance purposes. Still, the exact study area for different environmental attributes (water, air, noise, soil, etc.) is to be submitted considering the proposed activities and location, alignment, and proper reasoning, for identifying the exact impact and related mitigation measures. The project influence area will be selected accordingly.

Environmental Impacts due to Rehabilitation and Improvement of Polders System

Once the polders or hydraulic structures are constructed/reconstructed/rehabilitated, the environmental setting of the area might change, and consequently, the changing natural environment may impact the polders. Moreover, the embankments themselves will develop their areas, especially the embankment-side areas. Thus broadly, there are few sources of environmental impacts from embankment improvement as below:

(a) Improvements of critical portions of the polder's embankment
(b) Restoration of embankments and channel improvement in essential stretches.
(c) Increasing embankment height
(d) Upgrading drainage systems within polders by excavation/re-excavation or introducing hydraulic structure
(e) Earthworks
(f) Bricks and aggregates
(g) Source of the material
(h) Disposal of excavated wastes
(i) Induced impacts from embankment improvement

Design Issues & Mitigation

In the Design Stage, the main activities of the project are:

(a) Study to select the best alignment of the polders.
(b) Identify the need, type, and best location of the drainage structure
(c) Determine the need for dredging to avoid waterlogging within the polder area
(d) Further investigation on geoengineering to the detailed design of the polder section drainage structure.
(e) Design polder, drainage structure, and other technical facilities.
(f) Relocate some houses and infrastructural facilities; remove vegetation covers within the project for construction/reconstruction/rehabilitation of polder, bridges, and other technical facilities.
(g) Implement a resettlement action plan (RAP).
(h) Identify the sources of material.

Due to the implementation of the project, the following potential negative impacts will occur if these are not properly addressed during the design phase:

Damages due to Project Intervention and Land Acquisition

Issues: The project will need to acquire land to construct embankments and water control structures. House, shops common properties vegetation will be affected by the project interventions. The significance of this impact is expected to be major.

Mitigation- The project will conduct an alternative analysis for the alignment of the polder, considering the environmental, economic, and social benefits. The project intervention should consider minimum disturbance of infrastructures, people, and vegetation. The resettlement cost estimate should be performed beforehand, including compensation for land acquisition, structures, trees, fish stocks, and capacity building training for Environmental Assessment.

Loss of Agriculture Land

Issues- Agricultural land may be permanently lost in realignment/retreatment of a certain section of the polder. It has been observed that realignment/retreatment of many segments has already been done in the field. In terms of loss of agricultural land, the loss is irreversible.

Mitigation- The technical study should incorporate the necessary information about the polder's requirement of retirement/realignment. Consider realignment options for polders to avoid minimum encroachment of agricultural land. It is expected the polder will have more cultivable land in the long run. If possible, the farmers can be encouraged to cultivate high yield varieties for increasing cropping intensity in the remaining cultivable land during construction.

Noise Quality

Issues - Mobilization of construction vehicles for equipment and material transport will deteriorate the noise level at the surrounding sites. The traffic volume will be increased both on the road and river. The polder protected area is populated, and a number of common infrastructures like schools, madrasa, and mosques are inside the polder. The increased traffic volume is anticipated to increase noise pollution.

Mitigation – The contractors need to know the vehicle drivers not to use hydraulic horns and avoid unnecessary honking. The contractors should encourage the vehicles to come during the daytime.

Loss of Trees

Issues – There will be a loss of trees during the pre-construction stage due to clearing land for base widening of the polder, realignment of a polder in some areas, and establishment of construction camps.

Mitigation –During impact assessment, information about size, species, and the number of trees should be recorded. The project has an afforestation component. The component should prepare an afforestation plan based on the local species and trees cut. The overall impact is expected to be negative to positive in the long run. However, there will be a transition phase of impact between immature trees at the early stage and matured trees later. This will reduce the negative impact substantially in the long run.

Fisheries

Issues-The construction of embankments and dredging of canals have important consequences on flood plain ecology. The fish spawning will be impacted if canal excavation happens during the spawning period.

Mitigation- The technical study should incorporate the necessary information about the requirement/ repairing of hydraulic structures and the species to be affected by canal excavation. The fish migration route should be determined before the commencement of the work. The following actions can be considered to mitigate the adverse impact on fisheries:

- ✓ The canals of conservation importance should be identified during the design phase
- ✓ Adequate opening or providing fish pass along the routes of fish migration can minimize the negative impact on fish migration
- ✓ The loss can be compensated by promoting fish culture.

Increased Vehicular Traffic during Mobilization

Issues- During contractor mobilization, equipment, machinery, material, and manpower will be transported to the Polder, resulting in additional traffic on roads and waterways. This traffic may potentially cause traffic congestion, particularly on roads and jetties.

Mitigation - The following measures will be implemented to address the above concerns:

- ✓ The contractor will prepare a traffic management plan (TMP) and obtain approval from the Contractor Supervision Consultant. The TMP will be shared with the communities and finalized after obtaining their consent. The TMP will be submitted with the Environmental Action Plan (EAP)
- ✓ The TMP will address traffic congestion, and traffic movement will be avoided during school.
- ✓ Project-related traffic will be minimized during the peak traffic hours (from 8 am to 2 pm).
- ✓ Ensure minimal hindrance to local communities and commuters.
- ✓ Liaise with local communities and concerned authorities

Preparation of Facilities for Contractors and Labor Force

Issues- Establishing the contractor's temporary site facilities may involve land clearing, land leveling, excavation, and construction of buildings. These activities may cause air and water contamination, noise generation, safety hazards, a hindrance to local communities, and other similar impacts. The contractor will propose the possible location of construction yards. The locations will be temporarily established.

Mitigation- The following measures will be implemented to address the above concerns:

- The contractor will prepare a site establishment plan and obtain approval from the Construction Supervision (CS) consultant and share it with the EAP
- Approval from CSC will be accepted for the location of temporary facilities.
- Tree felling and vegetation clearing will be minimized to establish site facilities
- Photographic and video records will be maintained to record the pre-construction condition of the area
- The contractor will prepare and implement pollution control and waste management plans
- No untreated wastes will be released on the ground or in water
- Exhaust emissions from vehicles and equipment will comply with standards
- Vehicles, generators, and equipment will be properly tuned.
- Water will be sprinkled needed to suppress dust emissions
- Speed limits will be enforced for vehicles on earthen tracks
- Vehicles and machinery will have proper mufflers and silencers

- The liaison will be maintained with the communities
- Site facilities will be established safely from communities, avoiding schools, hospitals, religious centers, market places, road junctions, densely populated settlements, productive agriculture lands, archeological sites, etc.

Drainage congestion/Water Logging

Issues-Embankments can cause drainage congestion in adjacent areas during high rainfall if the high tide exceeds the height of the embankment due to an inadequate water outlet. This may cause crop damage and permanent loss of agricultural lands in extreme cases.

Mitigation- Excavation/Re-excavation of drainage channels needs to be considered during the design phase; if drainage congestion triggers by any activities, reconsider the location of the hydraulic structure and alignment of the embankment to avoid drainage congestion.

Sources of Material for Earthwork

Issues- The collection of material is a challenge for the project. The presence of continuous borrow pits on a riverside induces undercutting of the embankment toes and slopes due to the complete inundation of the riverbank or seashore during the monsoon. The borrow pits and adjoining low-lands, thus inundated, induce a parallel water current to flow near the embankment toes, eroding the surfaces rapidly. Earthwork material is expected to be collected locally.

Mitigation- During design, the segment-wise soil requirement and location of the sources of soil for earthwork for each polder construction/rehabilitation should be identified. The borrow pit chosen for the material bases should be discontinuous, on the land side and away from the toe line.

Disposal of Dredged Material

Issues- Dredging will be carried out in the silted drainage channels inside the polder. The spoil material obtained from the dredging activity may create hazards to habitat, sediment, and water quality.

Mitigation- In consultation with the DoE, the contractor will submit a spoil plan for approval. The spoil plan should show the location of proposed sites (landfill or borrow pits) to be used and the measures to be taken to rehabilitate these pits upon finalization of the Project. Costs of the spoil disposal will be included in the cost breakdown provided by the contractor within the bidding proposal and should be reflected in the contract. It is also recommended to utilize any dredged material for the reconstruction/rehabilitation of the polders. However, the soil quality of the dredged material should match the specified requirement of soil quality applicable for the reconstruction/rehabilitation of the coast polder. Suitable access to the materials will be agreed upon with the local authorities in consultation with the community. The key information to be collected before commencing dredging is as follows:

(a) the volume to be dredged;
(b) the disposal site to be used;
(c) quality of dredged material;
(d) applicability of the dredged material for reconstruction/construction/rehabilitation of polders

(e) any new pollution sources or known incidents (i.e., a spill) that might impact sediment quality to be dredged.

Flooding

Issues- If Tidal River Management (TRM) is followed in some Embankments, flooding in the low-lying area may occur.

Mitigation- If TRM is followed at any embankment, the design consultant should conduct a detailed study of the regional hydraulic regime, especially the flooding pattern, flow of water, and groundwater table during design. TRM is not encouraged at any site without a detailed investigation.

Public cuts

Issues- Public cuts and tubes linking a river or seaside with the countryside of its embankment are frequently observed. These cuts weaken the embankments, exposing them to slow but continual erosive forces. During a flood or cyclonic storm, breaching or major erosion occurs at those points. The people mainly cut the embankments to fulfill their purposes:

- To get rid of the existing structures' poor and inadequate drainage conditions, they quickly remove excess floodwater from the polder area to the river or the sea.
- They create temporary irrigation inlets for applying sweet river water to the cropping fields when prolonged droughts in the polder area.
- For short-term economic purposes yielding individual-level benefits, sometimes people allow river or seawater to penetrate inside the polder for shrimp cultivation or any other fishing requirement or salt panning.

Mitigation- Adequate consultation should be carried out segment-wise for each polder during the design phase to avoid the creation of temporary irrigation inlets and penetration of saltwater for shrimp cultivation.

Responsibility

- The design consultant will incorporate the environmental issues in the technical design with the help of environmental specialist.
- The design consultant should keep the invert level of the water control in such way that 25%-30% of the polder area lies in the permanent water bodies.
- BWDB will endorse the environment friendly technical design.
- BWDB can seek assistance of independent environment specialist input for ensuring environmental impacts have been addressed in the design adequately.
- The Contractor will address construction related activities planning in the Environmental Action Plan prepared by the contractor in line with the construction work plan

5. METHODOLOGICAL FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT

5.1 Introduction

This chapter outlines the framework for assessing and managing environmental and social issues in different polders. It also provides necessary procedures and tools for screening and evaluating environmental and social impacts. The environmental and social assessment of CEIP-2 IMD projects needs to be carried out based on the Environment Conservation Acts and Rules of GoB and the relevant World Bank's Environmental and Social Standards (ESSs).

5.2 Environmental and Social Management Procedure

5.2.1 Overall Procedure

CEIP-2 sub-projects will use a structured environmental and social management approach to allow the project development following the newly developed 10 ESSs, following the mitigation hierarchy of avoidance, minimization, mitigation, and compensation/offset for negative impacts, and enhancement of positive impacts was practically feasible. The following sections describe what needs to be done at each stage of the project life – sub-projects implementation, project activities implementation, and progress reporting.

5.2.2 General Principle (ESS 1-10)

Due to the nature of some of the proposed project activities under the CEIP-2 program and potential environmental and social impacts, the project falls under the 'RED' category according to ECR, 1997. Also, it falls under "Moderate to Substantial Risk Project' as per the World Bank ESS1, which requires proper IEE, ESIA, and implementation of the environmental and social management plan. Therefore, the ESMF is prepared based on the following principles that can lead to the BWDB's sub-project activities in Phase 1 of the CEIP-2.

- The Project Director of BWDB is responsible for the compliance with national policies, regulations, and World Bank ESSs and Guidelines, as mentioned in this ESMF report.
- BWDB is responsible for obtaining environmental clearance from DoE, local government agencies, and World Bank.
- IEE, ESIA, and ESMP need to be prepared for activities as determined by DoE.
- Planning and design of any additional activities should ensure minimal cumulative impacts.
- Environmentally Sensitive areas, cultural sites, and restricted or disputed lands should be taken care of with appropriate mitigation or compensation measures during implementation.
- BWDB should ensure the participation of stakeholders (especially the local community) in the planning, implementation, and monitoring of each sub-components and associated activities.
- BWDB will ensure an appropriate institutional setup for implementing environmental and social management plans and inter-agency coordination.
- Contractors to be engaged in the construction of polders under the program will ensure the provision of a First Aid Kit at the camp site with proper drinking water and sanitation facilities. Worker's/crew's health and safety measures shall be ensured, and personal protective equipment shall be in place.
- BWDB will ensure that safety provision has been provided for the resettlement sites (if any).
- BWDB will undertake public disclosure about the project interventions and potential impacts.

5.2.3 Environmental and Social Assessment and Management Process (ESS 1)

- The environment consultant of the PIU/major consulting firm will perform the environmental and social screening. The environmental consultant will start the task during the preparation stage of Phase-2.
- The environment consultant will update the Baseline condition, IEE, and the ToR for ESIA for Phase-2 of CEIP.
- BWDB will share the ESIA ToR with DoE for Clearance.
- CEIP-BWDB-PIU will review and clear screening and environmental assessment reports made by the Environmental consultant.
- BWDB will conduct verification of some screening and assessment.
- The main consultant/PIU will ensure that environmental considerations are given sufficient attention, weight, and influence over polder sites.
- The PIU/main consultant will prepare bid documents, and the contractor should implement ESMP.
- PIU/main consultant and BWDB will supervise CEIP-2 Program works.
- All the activities of CEIP-2 will follow the existing Environmental Code of Practices (ECoP) prepared under ESMF.
- The project will ensure that environmental impact assessment addresses all potential environmental direct and indirect impacts of the project and program throughout its life: pre-project, during project and operation stages, and mitigation measures have been taken.

5.2.4 Sub-Project Screening and Categorization

The formal environmental and social assessment in the sub-projects starts with the Environmental and Social Screening of proposed interventions using the screening formats provided in this ESMF (Appendix 2). Screening is usually carried out with the help of a simple matrix that includes a set of checks list to identify the baseline status and proposed potential impacts of the project intervention. Based on an extensive literature review and expert consultation, a screening matrix should be developed for CEIP-2, which will be attached to the Impact Assessment report of the project. The environmental assessment team members will update and use this matrix to collect information during site visits, interviews/consultations with stakeholders, and focus group discussions in the project intervention sites at the later stages. Environmental and Social Screening will determine whether sub-project interventions require a full-scale ESIA, including the ESMP or IIE with a site-specific ESMP.

The environmental and social screening would involve (i) reconnaissance of the sub-project area and its surroundings; (ii) identification of major sub-project activities; and (iii) preliminary assessment of the impacts of these activities on the ecological, Physico-chemical, and socio-economic environment of the sub-project surrounding areas and considerations that need to be further investigated through IEE/ ESIA.

Environmental and social risk classification takes into account relevant potential risks and impacts, such as:

- the type, location, sensitivity, and scale of the Project, including the physical considerations of the Project; kind of infrastructure (e.g., dams and reservoirs, power plants, airports, major roads); volume of hazardous waste management and disposal;

- the nature and magnitude of the potential E&S risks and impacts, including impacts on greenfield sites; impacts on brownfield sites (e.g., rehabilitation, maintenance, or upgrading activities); the nature of the potential risks and impacts (e.g., whether they are irreversible, unprecedented or complex); resettlement activities; and possible mitigation measures considering the mitigation hierarchy;
- the capacity and commitment of the Borrower to manage such risks and impacts in a manner consistent with the ESSs, including the country's policy, legal and institutional framework; laws, regulations, rules, and procedures applicable to the Project sector, including regional and local requirements; the technical and institutional capacity of the Borrower; the Borrower's track record of past Project implementation; and the financial and human resources available for management of the Project;
- other areas of risk that may be relevant to the delivery of E&S mitigation measures and outcomes, depending on the specific Project and the context in which it is being developed, including the nature of the mitigation and technology being proposed, considerations relating to domestic and regional stability, conflict or security.

Part of the screening process will also screen for any associated facilities[8] to the project. If any associated facility is identified, the requirements of this ESMF will apply to that facility.

5.2.5 Environmental and Social Impact Assessment

ESIA aims to give the environment and people its due importance in the decision-making process by clearly evaluating the environmental and social consequences of the proposed study before action is taken. Early identification and characterization of critical environmental and social impacts allow the public and the government to form a view about the environmental viability and social acceptability of a proposed development project and what conditions should apply to mitigate or minimize those risks and impacts.

The ESIAs will utilize a well-planned and all-inclusive communication and consultation strategy and include a baseline survey covering the prevailing status of income, employment, education, age, skills, and other socio-economic aspects and cultural and community aspects. The assessment will feed into the individual Resettlement Plans prepared for each site and will be incorporated, along with consultation feedback from those identified in the PAP census and all other relevant stakeholders, in the development of mitigation measures, especially livelihood strategies.

In the preparation phase, the ESIA shall achieve the following objectives:

- To establish the environmental and social baseline in the study area and to identify any significant environmental issue;
- To assess these impacts and provide for measures to address the adverse impacts by the provision of the requisite avoidance, mitigation and compensation measures;
- To integrate the environmental issues in the project planning and design;
- To develop appropriate management plans for implementing, monitoring, and reporting the suggested environmental mitigation and enhancement measures.

The impact assessment will be conducted using major stages as shown in the following diagram

[8] Associated facilities mean facilities or activities that are not funded as part of the project and are: a) directly and significantly related to the project, b) carried out, or planned to be carried out, contemporaneously with the project; and c) necessary for the project to be viable and would not have been constructed, expanded or conducted if the project did not exist.

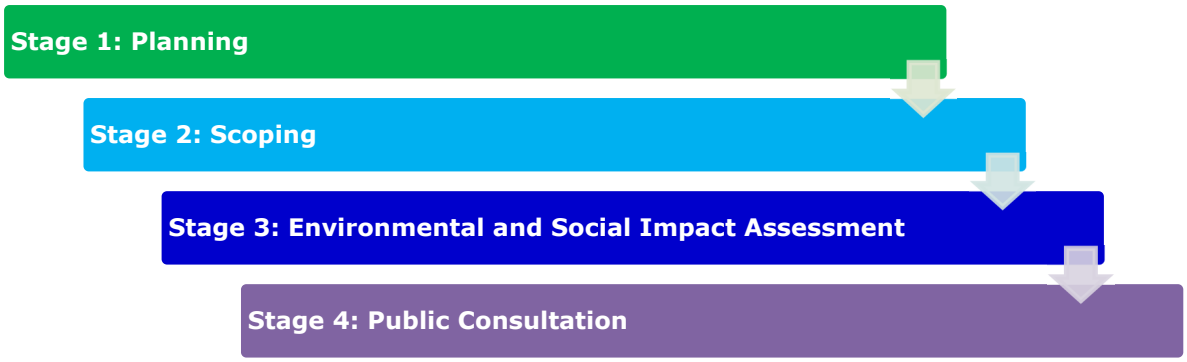

Figure 5-1: Impact Assessment Process Diagram

Stage 1: Planning

Soon after the commencement of the project, based on a desk study, reconnaissance survey, and experience of earlier similar projects, a detailed methodology and schedule should be prepared for the effective and timely execution of the Environmental Assessment.

Desk Study: To collect the secondary information and check out the methodology for carrying out the EA study and fixing of responsibilities of the EA team members for preparing a complete, addressing all issues Environmental Management Plan.

Reconnaissance survey: To collect first-hand information about the project area, develop a perspective of the entire team, and revise the methodology and work program.

Stage 2: Scoping

Scoping will identify which of the activities can interact with the environment. Scoping will be conducted early in the EA and SA process. A focus on the priority issues (i.e., those that have the greatest potential to affect nature and the environment) can be established for the rest of the EA and SA process.

After scoping, a necessary consultation with stakeholders will be made to incorporate any unattended issues. Key elements/inputs to the scoping exercise will be as follows:

- Gathering and reviewing existing environmental data like atmosphere, climate, topography, congestion area, alternative requirement, land use pattern, hydrology, drainage pattern, major River and waterways, religious, cultural, archaeological sites, and sensitive areas.
- Identifying project stakeholders, including PAPs, Government, and nongovernment agencies (utilities), BWDB, Department of Environment (DoE), etc.
- Assemble and review relevant legislative requirements, environmental standards, and guidelines (national and international) associated with the proposed development and the World Bank's operational policies and standards.
- Gathering existing information sources and local knowledge;
- Informing stakeholders of the project and its objectives and getting input on the EA and SA;
- Identifying the key environmental concerns (community and scientific) related to a project and the relative importance of issues;

- Defining/preparing the EA and SA work program, including a plan for public and stakeholder involvement;
- Carrying out monitoring of natural environment including air, water, soil, noise, etc.
- Defining the range of project alternatives to be considered.
- Obtaining agreement/consensus on the methods and techniques to be used in EA studies and document preparation;
- Determining/freezing the spatial and temporal boundaries for the EA studies.
- The following issues will be addressed through scoping but will not be limited to.
- To improve the quality of EA information by focusing scientific efforts and EA analysis on truly significant issues;
- To ensure environmental concerns are identified and incorporated early in the project planning process, at the same time as cost and design factors are considered;
- Reducing the likelihood of overlooking important environmental issues;
- Thinning the chance of prolonged delays and conflicts later in the EA process by engaging stakeholders in a constructive, participatory process early in the EA process.

Stage 3: Environmental and Social Impact Assessment

After conducting IEE, if necessary, the ESIA should be conducted, as per ToR for ESIA suggested in IEE, and cleared by DoE. The process of ESIA study is briefly described below:

Analysis of the Project Components: All the components of the PIU/ASSET and design specifications will be analyzed to get an insight into the project activities. This will guide a detailed environmental baseline survey and particular investigations.

Data collection on Environmental and social baseline: Environmental and social baseline conditions of the proposed PIU/ASSET will be collected through field visits, surveys, and intensive consultation with local people. Intensive consultation with the stakeholders should be carried out to update the baseline condition to obtain their perceptions of the proposed activities and the possible impacts.

Major Field investigations: At this stage, a detailed field survey (social and environmental) will be carried out to obtain information on the possible impact of the interventions on the environmental parameter.

Assessment of Impacts: The proposed PIU/CEIP-2 on the environmental and social components will be identified through consultation with experts and the local community. The impacts will be analyzed and graded qualitatively (e.g., high, medium, low) to determine the major impacts. Moreover, cumulative impacts of the project inside or outside the project area will be analyzed. Possible mitigation measures for alternatives to the project will be identified in this stage.

Evaluation of impacts: Impact assessed on different parameters will be evaluated for positive (+) and negative (-) impacts considering the magnitude, immediacy, reversibility, and sustainability. Impacts can also be quantified for the infrastructure projects; a typical CEIP project can evaluate the impact using the formula described below:

Impact Assessment of Infrastructure Projects

The Method of Assessment. In Bangladesh, it is only possible to estimate the potential environmental changes from the existing situation without a database. A simple methodology has been developed for Environmental Evaluation System (EES) developed by Battelle Columbus Laboratories in the United States. In this method, the existing environmental conditions will be the reference level, and the positive and negative changes in environmental conditions resulting from the proposed project will be evaluated. The environmental impact will be assessed by Environmental Impact Values (EIVs), which may be defined mathematically as follows:

$$EIV = \sum_{i=1}^{n} (V_i)(W_i)$$

where Vi is the relative change in the value of environmental quality of parameter I concerning the existing situation, Wi is the relative importance or weight of parameter I, and n is the total number of environmental parameters related to the project.

The computation of the Environmental Impact Value (EIV) of a project needs the determination of Vi, the value representing the magnitude of alteration of the environmental parameters, and Wi, the value representing the relative weight or importance of the respective parameters.

The magnitude of Environmental Alterations

Changes of environmental parameters should not be measured concerning existing conditions. The standard practice is to compare the future-with-project condition against the future-without-project condition; the difference is taken as the change in environmental parameters. The future-without-project state should be generated through trend analysis using historical data collected during the baseline condition.

The beneficial and adverse changes in environmental parameters resulting from a project, usually expressed in qualitative terms, have been plotted on a scale to quantify the environmental alterations. The figure shows the correlation between qualitative statements and proposed quantitative values of environmental changes resulting from a project.

Figure 5-2: Quantification of the impact

Impacts are assessed quantitatively wherever possible. Since the changes in environmental parameters are measured concerning existing conditions, no change has 0 values. Benefits or positive effects are graded from +1 to +5, and negative impacts are scored -1 to - 5. For example, if a project will positively impact agricultural productivity and the production will be

increased by 50%, scoring +3 is applied to agricultural productivity. Similarly, if assessed that the fish production will be decreased by 30%, a negative scoring of –2 is used for the respective fishery component. A value from the scale representing the project's effect on each parameter will be taken to compute the EIV of the project.

Where it is impossible to directly quantify the impact in terms of increase or decrease in production, deterioration of water quality, or degradation of the environment, the impact has to be estimated. For estimation, positive and negative impacts are divided into three groups: Low, Medium, and High. A low numerical value ranges from 1 to 2, Medium 3, and High with a numerical value ranging from 4 to 5.

Preparation of Environmental and Social Management Plan: The ESMP will be prepared to suggest mitigation measures for minimizing the effect of the negative impacts, compensation measures for the negative impacts which cannot be mitigated, enhancement measures for increasing the benefits of the positive impacts, emergency plan for taking care of natural hazards and accidental events. An environmental monitoring plan will also be suggested in the ESMP. Each component of the ESMP will be divided into pre-project, during the project, post-project, and operation and maintenance phases. The ESMP should also include an institutional capacity assessment and capacity-building plan. The responsibilities of the institutions in the implementation of the EMP will be suggested to ensure efficient utilization of all the parties involved.

ESIA Report Preparation: All the findings in the ESIA reports as per ToR.

Environmental Assessment and Management for Resettlement Sites: Environmental assessment and management principles and requirements described above will be equally applicable for constructing the resettlement sites (if any). If necessary, a general guideline to conduct ESIA of resettlement site/s will be prepared during the detailed ESIA.

Stage 4: Public Consultation (ESS 10)

"Public consultation" refers to the process by which the concerns of local affected persons and others who have a plausible stake in the environmental impacts of the project or activity are ascertained to consider all the material concerns in the project or activity design as appropriate. All Category 'High to Moderate Risk' projects or activities shall undertake public consultation.

After the public consultation, the environmental concerns will be addressed, and appropriate changes will be made in the draft ESIA and ESMP. The final ESIA report, so prepared, shall be submitted by the client to the concerned authority for appraisal.

5.3 Monitoring and Reporting Procedures

5.3.1 Monitoring Program

As one of the key elements of the ESMF and future ESMP, it is to implement an effective monitoring program to ensure compliance monitoring, effects monitoring, and external monitoring. The main purpose of this monitoring program is to ensure that the various tasks detailed in the ESMP, particularly the mitigation measures, are implemented effectively and to evaluate program impacts on the key environmental parameters. Various types of monitoring plans are discussed below.

Compliance Monitoring

The purpose of the compliance monitoring is to ensure that the contractor implements the mitigation measures given in the ESMP are effectively and in a timely implementation. The PIU will generally commission this monitoring with the help of checklists to be prepared based on the Mitigation Plan.

Effects Monitoring During Project Implementation

Effects monitoring is an important aspect of environmental management to protect the environment. The effects monitoring plan proposed for the CEIP-2, after the specific ESIA, this project will be revisited and revised. The monitoring will comprise surveillance to check whether the contractor meets the contract's provisions during the construction and operation of the program, including the responsible agencies for implementation and supervision.

Third-Party Monitoring

CEIP-2 will engage an independent consulting firm to conduct external and independent Audits and monitor the implementation of the below activities. The Environmental and Social Audit will be performed after the second year, and a report submitted to the Bank before the end of each year.

- Requirements set up in this ESMF, RF, SEP, ESCP, ESIA/ESMP, National EIA certificate and agreed Monitoring indicators and agreed on performance indicators.
- Review grievances and level of attention and resolution
- Accidents, GBV, etc.
- Documentation and development of a culture of safety and accountability at the district, participating environmental and social management units, etc.
- Application of national regulations in OHS, ESIA, Labour, Covid19 measures, others
- Access of information
- Other instruments agreed with the World Bank and the national agencies (permits, licenses, certificates)

Also, the main purpose of the external audit will be to ensure that all the key implementing entities and contractors are effectively and adequately fulfilling their designated role for ESMP implementation and that all the ESMP requirements are being implemented in a timely and effective manner. The ToR for contracting this consultancy will be prepared and submitted to the World Bank for approval and included in the Manual Operational Manual (POM).

Monitoring Frequency

Contractor EHSS Officers would be on-site daily or otherwise defined in the ESMP's mitigation measures to inspect active work sites and verify compliance with all applicable mitigation measures for the work phase. PMU E&S specialists shall monitor the site on a biweekly/monthly basis during civil works, depending on the sub-project scope. More frequent monitoring may be conducted to ensure compliance with the mitigation measures and resolution of any noted issues.

5.3.2 Compliance Reporting

Monthly Compliance Reports

Contractor ESHS Officers shall prepare and submit a monthly compliance report to the supervisory consultant, project participant, and PMU to document compliance activities

completed during the month and track the resolution of any issues that may have occurred. The reports should include the following information for the period:

- Summary of compliance activities
- The updated list of all ESHS incidents that happened during the project
- Follow up information on any past issues that are still being resolved
- Photographs of project activities related to the implementation of ESMP mitigation measures

Biannual Compliance Reports

The PMU shall prepare and submit a biannual compliance report to the World Bank on the compliance activities completed during the period and track the resolution of any issues that may have occurred for all sub-projects under implementation. The PMU will use daily compliance checklists and monthly compliance reports prepared by the construction contractors to develop the biannual report.

The biannual report should include the following information for the period:

- Key recommended follow-up issues, actions, time frame, and responsibility center.
- An introduction, Reporting period, and monitoring locations
- Summary of completed construction activities
- Estimate of remaining construction and schedule
- Summary of compliance activities
- Progress to date in implementing the ESMF, including key aspects monitored: such as waste management, health and safety practices, dust management, water quality, other environmental incidents and accidents, environmental awareness and training are undertaken, etc.
- PMU's and supervisory consultants' oversight activities (i.e., site visits)
- The updated list of all ESHS incidents that occurred during the project, including attached notices of non-compliance that were issued
- Follow up information on any past issues that are still being resolved

The Environmental and Social Monitoring Plan guideline is enclosed within Annex C. A tentative environmental compliance monitoring plan template is provided in Annex M. It can be used as a guideline to prepare the sub-project-specific monitoring plan. However, this attachment is not indicating the limitation of work. Rather, it can be modified based on project circumstances and depends on the sub-project-specific activities. If any changes are needed, they will be done with the consent of the ES specialist of BWDB and the World Bank.

6. INSTITUTIONAL ARRANGEMENT AND CAPACITY BUILDING

6.1 Introduction

A robust institution arrangement is required for ensuring sustainable, environment-friendly development. The institutional arrangement includes organizational support, training needs, and a plan and management information system. It also embraces the governmental and non-governmental organizations, consultants, contractors, interactions and arrangements between the key institutions, institutional arrangements for ESMF implementation in CEIP-2, responsibilities of all institutes involved in the project, capacity building plan, etc. The following section captures these institutional arrangements for ESMF implementation by concerned officials of BWDB, consultants, and working contractors. BWDB headquarters and field level adopted the organizational structure to ensure the proper implementation of the project in general, and the ESMF is shown below:

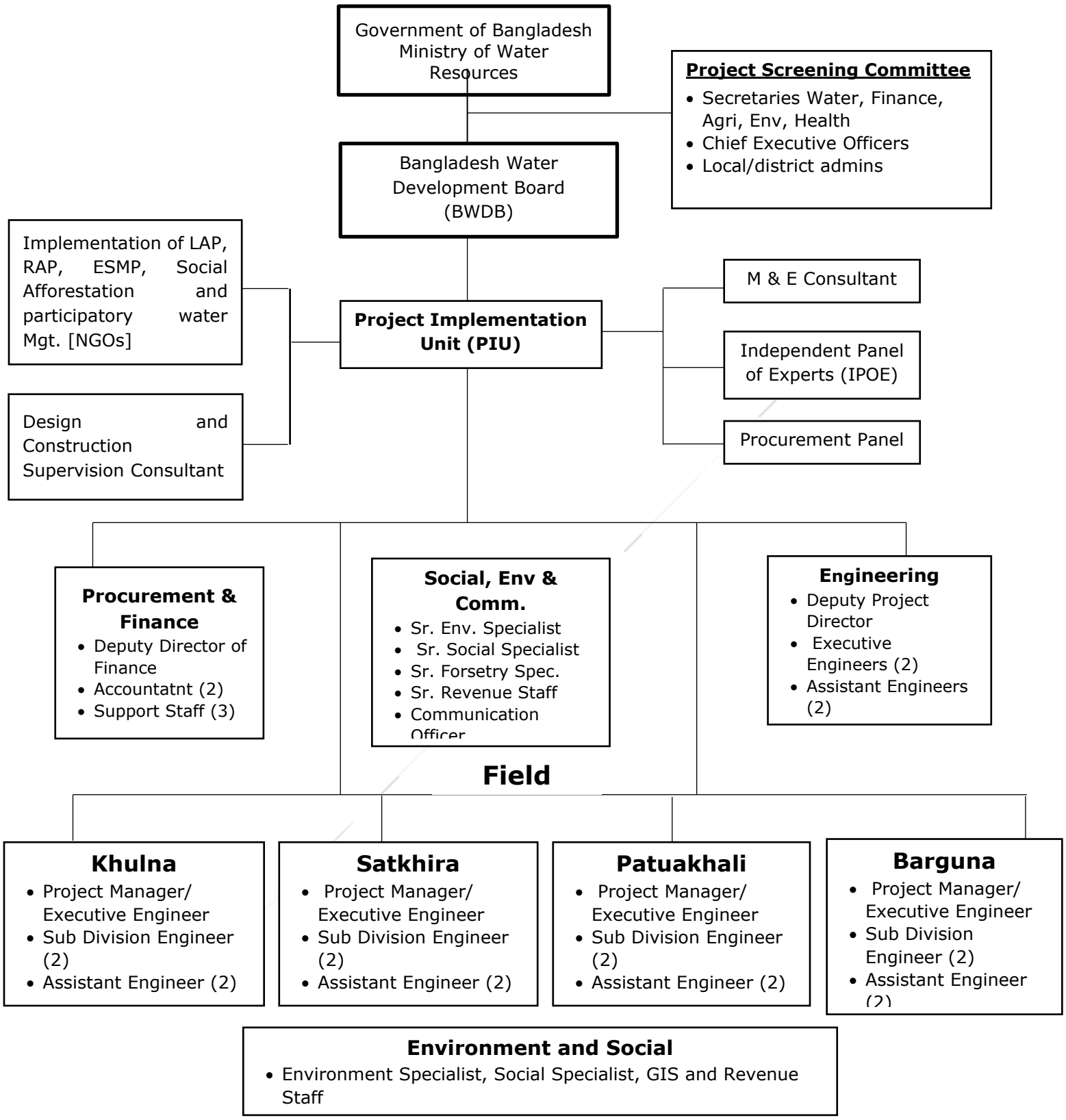

Figure 6-1: Instituional Arrangement of CEIP-2

In the above institutional arrangements, PIU will play the key role in successfully designing the project with the Ministry of Water Resources, BWDB, Consultants, Specialists, Engineers, and the field offices. Coordination among the consultants is a crucial issue, and the team leader of the CEIP-2 project will do that relentlessly. The CEIP-2 project is well designed, and the responsibility of each team is specifically determined, and that's why every team will work without any ambiguity.

6.2 Key Institutions/Persons Involved in the Implementation of the ESMF

6.2.1 Governmental and Non-Governmental Organizations

The success of the proposed environmental and social assessment depends on the clear identification and allocation of responsibilities and functions and the capability of the project management team in collaboration with other agencies to take proper actions throughout the various stages of the proposed project activities. The following organizations may involve during the implementation of CEIP-2 under BWDB:

- Ministry of Water Resources
- Bangladesh Water Development Board (BWDB)
- Bangladesh Inland Water Transport Authority (BIWTA)
- Local Administration (District/Upazila/Union)
- Community-based organizations (CBOs)
- Local Non-government organizations (NGOs)
- Environmental Unit of Local Government and Engineering Department (LGED)
- Department of Environment (DoE)
- Forest Department (FD)
- Department of Fisheries (DOF)
- Bangladesh Agricultural Extension (BAE)

6.2.2 Consultants

Many well-experienced environmental consultants (firms) in Bangladesh work with different development projects' environment and social aspects. PIU can appoint a qualified consultancy firm or individual consultant to conduct environmental and social assessment studies.

6.2.3 Contractor

Although BWDB will have a special institutional structure for the overall implementation of the EMP through Contractors, the contractor is responsible for the performance of EMP in the entire field during construction works. The Contractor should appoint a part-time or full-time environment and social development specialist for the project. In addition, the contractor shall be responsible for familiarizing themselves with "Chance Finds Procedures" in the ISEE/ESIA's Report in case culturally valuable materials are uncovered during excavation or any project activities. The contractors should prepare an ESMP implementation plan included in the Environmental Action Plan.

6.2.4 Interactions and arrangements between the key institutions

The process of ESIA and the monitoring of the ESMP involves substantial linkage and coordination between various line agencies. The BWDB will play a vital role in coordinating and managing this process, given in Figure 5-1. This organizational integration and cooperation are very important for environmental assessment, reporting, management, and the monitoring process for the CEIP-2 components. The BWDB will also liaise with the local NGOs for grassroots-level work with project-affected communities. These NGOs are instrumental in supporting the implementation of the ESMF.

6.3 Institutional Arrangements for ESMF Implementation in CEIP- 2

6.3.1 Project Implementation Unit (PIU) Setup

The PIU to be established to implement and manage the ESMF will be structured to provide coordination, technical support, and services during EISA's environmental screening and preparation and implementation of the environmental mitigation measures. Functions and the staffing responsibilities of PIU are listed in the table below. The PIU will be established and operational to effectively manage the EISA process and ESMP implementation, awarding the contract to the contractor. One senior Environment Specialist will be at headquarter. One environment specialist will be posted at the field level to support to Khulna and Barishal divisions.

Table 6-1: Functions and Responsibilities of the PIU Designation Function/Responsibility PIU (Sr. Environment Specialist)

Designation	Tasks/Responsibility
ESC (Sr. Environment Specialist)	• Assist the PD in conducting environmental screening and categorization of each polder • Assist the PD in the implementation of the EMF during the project implementation period; • Preparation of EISA and finalization of the same in close co-ordination with the PIC and the World Bank; • Ensure integration of the EISA and resulting ESMP into the polder redesign and implementation plans (contract documents); • Ensure compliance with the mitigation measures by the Contractors; • Ensure incorporation of appropriate environmental specifications (based on screening and ESCP) into the respective bidding & contract documents; • Assist the BWDB Engineers at the site by providing appropriate environmental advice and developing appropriate environmental mitigation measures for each polder; • Documenting the experience in the implementation of the environmental process; • Assist PIU consultants and BWDB community organizers in carryout participatory consultation during planning, design, and implementation; • Assist the PD in obtaining Environmental Clearances from the DOE; • Assist in the development of training program for the key stakeholders (BWDB, contractors, public representatives, and local government institutions/ NGOs, in collaboration with the field level junior Environmental Specialist; • Review and approve the Contractor's Implementation Plan for the environmental measures, as per the EMP; • Liaison with the Contracts, CS for the Implementation of the EMP; • Liaison with the DOE on environmental and other regulatory matters; • Interact with the NGOs and Community based organizations to be involved in the project for EMP implementation;

	• Dialogue with the project affected persons (PAPs) and ensure that the environmental concerns and suggestions are incorporated and implemented in the project; • Undertaking environmental monitoring and reporting to the Project Director and follow-up activities; • Assist field level junior environment specialist to resolve any environment-related issue in the project • Document the standard construction practices in the project on incorporation and integration of the environmental problems into engineering design and on implementing measures in the polder reconstruction/rehabilitation and maintenance programs; • Assist the PD in arranging for the Environmental Auditing and following up on the Audit recommendation. • Report to the PD on the environmental aspects pertaining to the project. • To guide and assist the PD and the BWDB in strengthening environmental management practices in polder rehabilitation and hydraulic structure construction. • Ensuring Update of Database for polder specific environmental information • Prepare periodic progress reports on the implementation of the EMF for transmission to the World Bank throughout the project implementation period. • Update of Environmental Management Plan and Environmental Impact Assessment after receiving information from the contractors and design consultants. • Capacity Building of the responsible assistant and deputy chief responsible for environmental sustainability assurance of BWDB project • Maintaining Polders Specific Database for Environmental Management
Field Level Environment Specialist	• Assist the Design Consultants in the Environmental screening process • Assist the PMU in Environmental Assessments for the projects; • Assist PMU in obtaining requisite Environmental Clearances for the project; • Assist the Senior Environment Specialist and the Environmental Specialist of the Design Consultants and CS consultants in the preparation of the training materials and in conducting training; • Review the contractor's Implementation Plan for the environmental measures, as per the EMP with assistance from the Environmental Specialist of the MS and DS consultant; • Liaison with the contractors and CS on the implementation of the EMF and EMP; • Carryout consultations with the NGOs and community groups to be involved in the project;

	• Establish dialogue with the affected communities and ensure that the environmental concerns and suggestions are incorporated and implemented in the project; • Carry out site inspections, check and undertake periodic environmental monitoring and initiate necessary follow-up actions; • Document the good practices in the project on incorporation and integration of environmental issues into engineering design; • Report to the Executive Engineer (Environment) / PD on the environmental aspects pertaining to the project; • Assist in preparing periodic reports for dissemination to the PMU, World Bank, etc. BWDB core unit has posts of 4 Assistant Chief and 2 Deputy Chief to oversee the overall environmental compliance of BWDB implemented projects. Under CEIP, the PIU unit will train the BWDB people responsible for monitoring environmental compliance. Thus the smooth transition to BWDB will ensure environmental compliance during the O&M after the project completion.

BWDB core unit has posts of 4 Assistant Chief and 2 Deputy Chief to oversee the overall environmental compliance of BWDB implemented projects. Under CEIP, the ESC unit will train the BWDB people responsible for monitoring environmental compliance. Thus, the smooth transition to BWDB will ensure environmental compliance during the O&M after the project completion.

6.3.2 Field-Level Setup

The consultants will be responsible for the overall supervision of polder rehabilitation-related activities. The consultants should prepare a supervision and monitoring plan. The consultants will ensure quality control and report to PD. The Consultant will also assist the PIU in ensuring environmental compliance and monitoring progress, including ESMP and ESCP implementation. BWDB will ensure that proper environmental screening, ISEE, and ESIA for each polder has been done. BWDB will have a separate Environmental Consulting Firm to conduct the Social environmental screening (ESS), ISEE, and ESIA. The design consultant will ensure that the ESS, ISEE, or ESIA findings have been addressed. BWDB will verify some screening and assessment. BWDB will provide the design consultant incorporating ESS, ISEE, and ESIA findings.

The project will support at least one or more (need-based) Environment Specialists in Supervision. The specialists will prepare subproject-specific environment screening/assessment reports with ESMP, supervise ESMP implementation, and support capacity building of the field level staff of BWDB and contractor. PIU will review the ESMF and ensure the environmental screening/assessment quality with ESMP. The project will implement an environmental monitoring program (i) to monitor the contractor's work during project implementation to check contractual compliance with specified mitigation measures, and subsequently (ii) to assess the actual environmental impacts of the project over the years following completion of the various project components. The Senior Environment Specialist of PIU will design the detailed monitoring plan of the project and prepare a routine monitoring report based on the monitoring results by BWDB. In addition, the environmental audit will be carried out before the mid-term evaluation and before the project closes. The Bank would also supervise environmental compliance as part of regular implementation support missions.

Chance-Find Procedures for Physical Cultural Property

The Contractor will be responsible for familiarizing themselves with the following "Chance Finds Procedures" in case culturally valuable materials are uncovered during excavation or any project activities as per Antiquities Act, 1968, including:

- Stop work immediately following the discovery of any materials with possible archeological,
- historical, paleontological, or other cultural value, announce findings to the project manager and
- notify relevant authorities.
- Protect artifacts and possibly use plastic covers and implement measures to stabilize the area, if necessary, to protect artifacts properly.
- Prevent and penalize any unauthorized access to the relics; and
- Restart construction works only upon the authorization of the relevant authorities (e.g., Upazila Nirbahi Officer, Deputy Commissioner, and Department of Archeology).

Monitoring

The PIU will dedicate part of its time to monitoring all project activities and reporting to the PD. Regular monitoring of activities is carried out by CEIP- 2 divisional offices and supervision consultants and reviewed by the PIU every month. The PIU and Directors also regularly review ongoing project activities, including environmental issues, and corrective measures are implemented at the site. For environmental components of a project, environmental monitoring plan is developed based on baseline data and impacts predicted during the environmental assessment process.

As part of their duties, the concerned forest department staff monitor impacts on ecological resources and activities of afforestation. The environmental monitoring plan for each project will be integrated with construction, operation, and maintenance and shall be monitored by the PIU every month. The higher management is apprised through a monthly report. The PIU will share a half-yearly monitoring report with Bank.

6.3.3 Capacity Assessment

Since the effectiveness of the Environmental, Social Assessment & Implementation depends considerably on the understanding and preparedness of their Engineers and their Environmental, Social Team (Consisting of Contractor Environmental specialist, Consultant environmental specialist, Social Specialist, and PIU of BWDB). It is important that the project authority tries to sensitize the Engineers and Environmental Team on managing environmental & social issues, provides guidance, and encourages them to build requisite capacities. A two-prong strategy can achieve capacity building.

- Training program for existing staff.
- Technical Assistance: knowledge sharing with consultants, having requisite expertise.

Capacity assessment is key to identifying training needs and preparing a training curriculum based on the training needs. The project will undertake an intensive capacity assessment exercise to design a needs-based training program to identify training needs.

6.3.4 Training Programs

Project Management, Technical Assistance, Training, and Strategic Studies will support institutional capacity building, technical assistance, and training. The project will provide essential technical assistance (TA), consulting services, and advanced staff training. Under a TA consultancy service, technical (EMS) training and capacity building expertise will be undertaken to roll out EMS requirements in BWDB units and via Workshops for contractors, consultants, and other external stakeholders.

Capacity building training programs should be undertaken in the following area:

- Training of the management level officials of BWDB, BWDB environmental compliance personnel on the overall environmental concerns and responsibilities for implementing ESMP
- Recruitment of new professionals with a background in the environment, if required, and provide
- necessary training
- Organizing workshops seminars with stakeholders on the environmental matters of CEIP- 2
- Special training program for the contractors and workers on the ESMP and their responsibilities will construct the project interventions
- The Contractors will provide a guideline for the preparation of the Environmental Action Plan in line with the construction work plan
- Training of the WMOs on the successful operation of hydraulic structures
- Training on the structured format in reporting for all stages of implementation and those of relevant agencies involved in ESMP implementation
- The training programs should be arranged before implementing the interventions in the polder area. Detail plan can be made by the proposed 'Environment Unit' of BWDB

7. PUBLIC CONSULTATION AND DISCLOSURE PLAN

7.1 Introduction

Public Consultation and Disclosure are mandatory for the ESA study of any development project according to the ESIA Guidelines of DoE and World Bank's new ESSs. Public consultation and disclosure aim to involve the stakeholders in the project development and implementation process. The proposed project planning interventions and alternative options are discussed during the consultation process, while the impact assessment results are shared during the disclosure sessions. The proposed interventions and alternative options for respective coastal polder development under the CEIP-2 project were consulted with stakeholders, and the findings are presented in this chapter. Also, methods of disclosure of environmental assessment findings are presented here.

Requirements of ESS 10: Stakeholder Engagement and Information Disclosure of CEIP-2

A separate Stakeholders Engagement Plan (SEP) will be prepared for CEIP-2, the main guiding document for the polder development under CEIP-2. The following sections summarize the ESMF requirements for stakeholder consultations and disclosures specifically for preparing ESMP.

7.2 Stakeholder Consultations and Disclosure (ESS 10)

In the context of the above, field surveys consultations with different stakeholders that were carried out to develop this ESMF of the CEIP-2 project are not enough considering the project area and dimension of the stakeholders. Consultation meetings are necessary to identify issues and problems to enable BWDB to include corrective measures and identify lessons and opportunities to enhance the program implementation mechanism. Extensive field visits are required at the ESIA stage to overcome this shortcoming and conduct extensive discussions with the relevant stakeholders throughout the program sites to discuss components, sub-components, activities, potential positive and negative impacts, and measures taken to mitigate those impacts. It is also required to record the views of each of the respondents of the consultations, irrespective of gender, profession, religion, and age group. The ToR of the ESIA should be described in the public meetings during the initial stage of the ESIA in all the proposed project sites. Findings of the ESIA will also be presented in the local language, going back to the same stakeholders while the draft is ready to submit for DoE clearance.

Objectives of Public Consultation and Disclosure

The main objective of public consultation and disclosure is to involve local inhabitants/stakeholders of coastal polders in the project planning and implementation process. The specific objectives of public consultation and disclosure were to:

- Get feedback on the proposed project interventions and possible environmental and social impacts
- Know about the perceived ideas of stakeholders on mitigation/ enhancement/ compensation/ contingency of potential negative/positive impacts of the proposed interventions
- Inform the stakeholders about the possible land acquisition (LA), if any, and its implications on different groups of people, including vulnerable ones
- Know about the potential conflict of interest, if any, and suggestions for resolving those
- Make the stakeholders aware of the possible environmental and social impacts.

- Share the results of the impact assessment according to the important environmental and social components with the stakeholders

A flowchart with a brief description of the public consultation approach, stakeholder mapping, and analysis is given below:

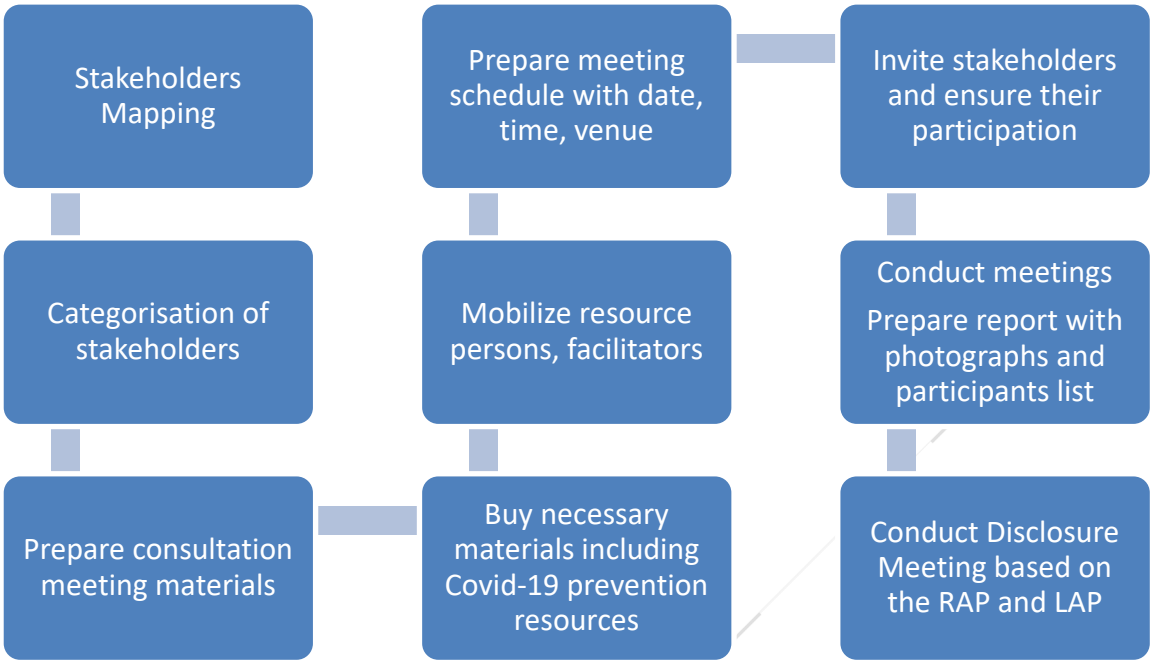

Figure 7-1: Stakeholder Mapping and Analysis Process Framework

7.3 Stakeholder Mapping and Analysis

The consultant team will conduct stakeholder analysis during social and environmental screening and finalize the alignment in the preparation stage. The consultant team will:

ii) Carry out a stakeholder analysis to categorize the most important actors for the proposed project's preparation, design implementation, and monitoring.

iii) Identify the small ethnic communities/tribal peoples (if any) in the polders and on the embankment, review and assess their identity because of the characteristics of indigenous peoples as laid down in ESF. A Small Ethnic Community Development Plan will be prepared following the SECPF of the project.

Preparation of Stakeholder Mapping and Analysis Report

Stakeholder mapping examines the relative influence that different individuals and groups have over a project and its power over them.

The purpose of stakeholder mapping is to:

- Study the profile of the stakeholders identified and the nature of the stakes.
- Understand each group's specific issues, concerns, and expectations from the project that each group retains.
- Gauge their influence on the project.

Categorization of stakeholders

Based on this understanding, the stakeholders are categorized into high influence/priority, medium influence/priority, and low influence/priority. The stakeholders categorized as an increased influence have a high power over the project or are likely to be heavily impacted by

the project activities and are thus high up on the project proponent's priority list for engagement and consultation.

Similarly, the stakeholders categorized as a medium influence have moderate power over the project. Even though they are to be impacted by the project, it is unlikely to be substantial. These stakeholders are thus neither high nor low on the project proponent's list for engagement. On the other hand, the stakeholders with common influences have a minimal effect on the decision-making process or are minimally impacted by the project and are thus low in the project proponent's engagement list.

The consultant team will prepare the stakeholder's analysis report following the WB's new ESF. The information will contain a list of participants and venue, date, time, topics of discussion, and outcome of the meeting. The format will be shared before reporting for approval, and the report will be drafted following the approved form.

7.4 Consultation Process

As part of the Environmental and Social Assessment of the CEIP-2 project, two-stage 'public consultation' need to be carried out – at local and national levels; KMC has conducted 41 public consultation meetings at the local level in the coastal area (see Table 5-1 and Figure 5-1). National level consultation workshop will be shown after preparing the 'draft Environmental and Social Management Framework. A Sample list of participants attending the public consultation meetings is given in Appendix –4.

Table 7-1: Public consultation meetings in coastal polders

Summary Information of the Consultation Meetings

Sl. No	Meeting place	District	Hydrological zone	Date of Meeting	Total number participants		
					M	F	T
1	Pakhimara Primary school,Samnagar, Paddopukur	Satkhira	GTPW	5th December, 2021	129	02	131
2	Protap Nagor Union Parishad Assasuni	Satkhira	GTPW	5th December, 2021	22	13	35
3	Garkumarpur Bazar Samnagar	Satkhira	GTPW	5th December, 2021	110	01	111
4	Goaldanga Fokirbari High School, Assasuni	Satkhira	GTPW	6th December, 2021	67	0	67
5	Anualia Govt. Primary School Assasuni	Satkhira	GTPW	6th December, 2021	46	01	47
6	Baradal Union Parishad, Assasuni	Satkhira	GTPW	6th December, 2021	47	10	57
7	Chechua Fazil Madrasha Assasuni	Satkhira	GTPW	6th December, 2021	46	06	52
8	Khazra Union Porishad, Assasuni	Satkhira	GTPW	6th December, 2021	36	02	38
9	Fotapur Primary School, Chandkhali UP, Paikgacha	Khulna	GTPW	7th December, 2021	50	15	65
10	Bagba Kathaltola Bazara, Koyra.	Khulna	GTPW	7th December, 2021	95	0	95
11	Mosjidkur Govt. Primary School, Koyra.	Khulna	GTPW	7th December, 2021	37	08	45
12	Horinkhola Govt. Primary School & Cyclone Centre, Koyra.	Khulna	GTPW	7th December, 2021	64	34	98
13	Gazi Abdul Zabbar School & College, Koyra.	Khulna	GTPW	8th December, 2021	83	0	83
14	Bagali Union Parishad, Koyra	Khulna	GTPW	8th December, 2021	42	04	46
15	Motbari Santimoyee Govt. Primary School, Koyra	Khulna	GTPW	8th December, 2021	41	29	70
16	Voyang Sarafatia Secondary School, Mirzagonj.	Patuakhali	GTPW	11th December, 2021	87	0	87

Sl. No	Meeting place	District	Hydrological zone	Date of Meeting	Total number participants		
					M	F	T
17	Kudbarchar Adarsha Secondary Girls School, Mirzagonj.	Patuakhali	GTPW	11th December, 2021	71	0	71
18	92 Baliatoli Govt, Primary School, Barguna Sadar	Barguna	GTPW	12th December, 2021	63	0	63
19	Chalitatoli Secondary School, Barguna Sadar	Barguna	GTPW	12th December, 2021	47	0	47
20	Khalishakhali Bazar, Mirzagonj	Patuakhali	GTPW	13th December, 2021	82	0	82
21	South Gabua Hamidia Shamsun Nahar Dakhil Madrasha., Mirzagonj	Patuakhali	GTPW	13th December, 2021	46	01	47
22	Ronogopaldi Union Parishad Dashmina	Patuakhali	GTPW	14th December, 2021	199	06	205
23	Alipur Union Parishad Office, Dashmina	Patuakhali	GTPW	14th December, 2021	71	02	73
24	Hazirhat Govt. Primary School Dashmina	Patuakhali	GTPW	18th December, 2021	112	03	115
25	Betagi Sankipura Union Parishad Office, Dashmina	Patuakhali	GTPW	18th December, 2021	134	12	146
26	Aoliapur High School, Dashmina.	Patuakhali	GTPW	18th December, 2021	112	01	113
27	Debpur Govt. Primary School, Kalapara	Patuakhali	GTPW	9th January 2022	82	0	82
28	Londa Hafiz Uddin Secondary School, Kalapara	Patuakhali	GTPW	9th January 2022	70	0	70
29	Haldia Union Parishad Amtoli	Barguna	GTPW	9th January 2022	37	0	37
30	Gazipur Bandar Secondary School, Amtoli.	Patuakhali	GTPW	9th January 2022	114	03	117
31	Patuabazar, Kalapara	Patuakhali	GTPW	9th January 2022	118	0	118
32	Charbadura Govt. Primary School, Galachipa.	Patuakhali	GTPW	11th January 2022	186	03	189
33	Nizampur Govt. Primary School, Kalapara.	Patuakhali	GTPW	16th January 2022	66	01	67

Sl. No	Meeting place	District	Hydrological zone	Date of Meeting	Total number participants		
					M	F	T
34	Mohipur Union Parishad, Kalapara	Patuakhali	GTPW	16th January 2022	110	09	119
35	Nizshipbaria Primary Govt. School, Kalapara	Patuakhali	GTPW	16th January 2022	52	0	52
36	Assasuni Union Parishad, Assasuni	Satkhira	GTPW	6th February 2022	68	04	72
37	Champaful Union Parishad, Assasuni	Satkhira	GTPW	6th February 2022	82	0	82
38	Mariala High School, Assasuni	Satkhira	GTPW	7th February 2022	43	09	52
39	Kalimakhali Govt. Primary School, Assasuni	Satkhira	GTPW	7th February 2022	68	01	69
40	Shovonali Union Parishad, Assasuni	Satkhira	GTPW	8th February 2022	47	05	52
41	Kola Govt. Primary School, Assasuni	Satkhira	GTPW	8th February 2022	66	0	66
				Total	**3148**	**182**	**3330**

A participatory approach was followed to identify the participants and conduct a public consultation. Initially, the consultants talked with the Upazila Chairman, Upazila Nirbahi Officer (UNO), UP Chairman, and knowledgeable person in the study area to get a clear view of the study area and get support for identifying the potential key persons who should be invited to attend the consultation meetings. The venue, date, and time of those meetings were fixed in consultation with the Upazila Nirbahi Officer (UNO) and the key persons of the respective venues. In the four consultation meetings, the Upazila Chairman, Upazila Nirbahi Officer (UNO), Upazila officials from different departments (fisheries, agriculture, and livestock, etc.); Chairman, Member, and secretary of Union Parishad, local people of varying occupations, including farmers, businessmen, day laborers, farm and non-farm laborers, etc.; the knowledgeable persons including teachers, service holders, journalist, etc. and representatives of project authority participated.

Thirty-one stakeholders attended the Stakeholders Consultation Meeting, including UP Chairmen, UP Members, local Political Party Leaders, Migrants Workers, Widows, Women, Teachers, Journalists, Community Leaders, Religious Leaders, and others. The category and number of participants who attended the meeting are in Appendix - 4.

Table 7-2: Category and Number of Participants Attended the Consultation Meeting Mentioned Above

Sl. No.	Type of Participants	Polder Number	Upazila & District	Male	Female	Total
1	UP Chairman	4, 7/1,7/2, 10-12, 13-14/2 41/5,54 41/7,47/1 55/2D	**Upazila :** Samnagar, Assaasuni, Paikgacha, Koyra, Mirzagonj, Barguna Sadar, Dashmina, Kalapara, Amtoly, Galachipa **District:** Satkhira, Khulna, Patuakhali, Barguna	22	-	**22**
2	Up Member	4, 7/1,7/2, 10-12, 13-14/2 41/5,54 41/7,47/1 55/2D	**Upazila :** Samnagar, Assaasuni, Paikgacha, Koyra, Mirzagonj, Barguna Sadar, Dashmina, Kalapara, Amtoly **District:** Satkhira, Khulna, Patuakhali, Barguna	97	22	**119**
3	Teachers	4, 7/1,7/2, 10-12, 13-14/2 41/5,54 41/7,47/1	**Upazila :** Samnagar, Assaasuni, Paikgacha, Koyra, Mirzagonj, Barguna Sadar, Kalapara, Amtoly **District:** Satkhira, Khulna, Patuakhali, Barguna	90	4	**94**
4	Fisherman	4, 7/1,7/2, 10-12, 13-14/2 41/5,54 41/7,47/1 55/2D	**Upazila :** Samnagar, Assaasuni, Paikgacha, Koyra, Mirzagonj, Barguna Sadar, Dashmina, Kalapara, Amtoly **District:** Satkhira, Khulna, Patuakhali, Barguna	270	-	**270**
5	Farmer	4, 7/1,7/2, 10-12, 13-14/2 41/5,54 41/7,47/1 55/2D	**Upazila :** Samnagar, Assaasuni, Paikgacha, Koyra, Mirzagonj, Barguna Sadar, Dashmina, Kalapara, Amtoly, Galachipa **District:** Satkhira, Khulna, Patuakhali,	1010	0	**1010**

			Barguna.			
6	Village Doctor	4, 7/1,7/2, 10-12, 13-14/2 41/5,54 41/7,47/1 55/2D	**Upazila :** Samnagar, Assaasuni, Paikgacha, Koyra, Mirzagonj, Dashmina, Kalapara,Galchipa **District:** Satkhira, Khulna, Patuakhali, Barguna	13	-	**13**
7	Surveyor	54	**Upazila :**Galchipa **District:** Patuakhali	1	-	**1**
8	Boat Man	7/1,7/2	**Upazila :** Samnagar, Assaasuni, **District:** Satkhira,	2	-	**02**
9	Contractor	41/7	**Upazila :**Mirzagonj, **District:** Patuakhali	1	-	**1**
10	Business	4, 7/1,7/2, 10-12, 13-14/2 41/5,54 41/7,47/1 55/2D	**Upazila :** Samnagar, Assaasuni, Paikgacha, Koyra, Mirzagonj, Barguna Sadar, Dashmina, Kalapara, Amtoly, Galachipa. **District:** Satkhira, Khulna, Patuakhali, Barguna	1045	4	**1049**
11	Service Holder	4, 7/1,7/2, 10-12, 13-14/2 41/5,54 41/7,47/1 55/2D	**Upazila :** Samnagar, Assaasuni, Paikgacha, Koyra, Mirzagonj, Barguna Sadar, Dashmina, Kalapara, Amtoly,Galachipa **District:** Satkhira, Khulna, Patuakhali, Barguna	228	-	**228**
12	Day Labor	4, 7/1,7/2, 10-12, 13-14/2 54 41/7,47/1 55/2D	**Upazila :** Samnagar, Assaasuni, Paikgacha, Koyra, Mirzagonj, Dashmina, Amtoly **District:** Satkhira, Khulna, Patuakhali, Barguna	112	12	**124**
13	Driver	4, 7/1,7/2, 10-12, 13-14/2 41/5,54 41/7,47/1 55/2D	**Upazila :** Samnagar, Assaasuni, Paikgacha, Koyra,Mirzagonj,Dash mina, Kalapara, Amtoly Galachipa **District:** Satkhira,	50	-	**50**

			Khulna, Patuakhali, Barguna			
14	Student	4, 7/1,7/2, 10-12, 13-14/2 41/5,54 41/7,47/1 55/2D	**Upazila :** Samnagar, Assaasuni, Paikgacha, Koyra,Mirzagonj,Dashmina, Barguna Sadar,Kalapara, Amtoly Galachipa **District:** Satkhira, Khulna, Patuakhali, Barguna	82	1	**83**
15	Retired Service Holder	7/1, 10-12, 13-14	**Upazila :** Samnagar, Paikgacha, Koyra, **District:** Satkhira, Khulna.	15	-	**15**
16	Housewife	4, 7/1,7/2, 13-14/2, 54, 55/2D	**Upazila :** Samnagar, Assaasuni, Paikgacha, Dashmina,Kalapara **District:** Satkhira, Khulna, Patuakhali,	-	141	**141**
17	Journalist	4.7/1 13-14/2, 54,	**Upazila:** Samnagar, Assaasuni, Paikgacha, Galachipa, **District:** Satkhira, Khulna, Patuakhali,	11	-	**11**
18	Wood Worker	7/1	**Upazila:** Samnagar **District:** Satkhira.	1	-	**1**
19	Religious Leader	4,7/1 41/7	**Upazila :** Samnagar, Assaasuni,Mirzagonj **District:** Satkhira, Patuakhali,	4	-	**4**
20	Carpenter	7/1,13-14/2	**Upazila :** Samnagar, Paikgacha **District:** Satkhira, Khulna	2	-	**2**
21	Van Puller	7/1,7/2,47/1	**Upazila :** Samnagar, Assasuni,Kalapara **District:** Satkhira, Patuakhali	8	-	**8**
22	Village Police	4,55/2D, 41/7	**Upazila :**Dashmina Assasuni,Mirzagonj **District:** Satkhira, Patuakhali	**10**	**-**	**10**
23	Immigrant	13-14/2,54	**Upazila :** Paikgacha, Amtoli **District:** Khulna, Barguna	**2**	**-**	**2**

24	Mason	**54,13-14/2,41/5, 47/1,55/2D**	**Upazila :** Galachipa,Amtoli, Kalapara,Paikgacha Barguna Sadar, Mirzagonj, Dashmina **District:** Khulna, Patuakhali, Barguna	**42**	**-**	**42**
25	Singer	**7/1**	**Upazila : Samnagar District:Satkhira**	**1**	**-**	**1**
26	Social Worker	**4,13-14/2,10-12,41/5,55/2D,41/7**	**Upazila** :Assasuni, Koira, Paigacha, Barguna Sadar, Dashmina, Mirzagonj **District:** Khulna, Satkhira, Barguna, Patuakhali	**21**	**-**	**21**
27	Zila Parishad Member	**4**	**Upazila** :Assasuni, **District:** Satkhira	**1**	**-**	**1**
28	Lawyer	**41/7,54**	**Upazila** :Mirzagonj, Kalapara **District:** Patuakhli	**3**	**-**	**3**
29	Freedom Fighter	**47/1,4**	**Upazila** : Kalapara, Assasuni **District:** Patuakhali Satkhira	**3**	**-**	**3**
30	Deed Writer	**41/7**	**Upazila**: Mirzagonj **District:** Patuakhali	**1**	**-**	**1**
31	Barber	**41/7**	**Upazila** : Mirzagonj **District:** Patuakhali	**1**	**-**	**1**
			Total	**3149**	**184**	**3333**

Stakeholder consultation meeting in Shyamnagar, Satkhira.

Stakeholder consultation meeting in Assasuni, Satkhira.

	
Stakeholder consultation meeting in Koyra, Khulna	Stakeholder consultation meeting in Bagali UP, Koyra, Khulna.

Figure 7-2: Public consultation meetings held in coastal areas

7.5 Issues discussed in the Public Consultation Meetings

The checklist used for consultation includes the following issues:

- Knowledge of the participants about the CEIP-2 and people's attitudes towards the proposed project interventions.
- Perception of local people about problems regarding the polders and suggestions for solution of the issues perceived considering:
  - Water resources (surface water, siltation, water salinity, drainage, groundwater salinity, water infrastructure management, etc.)
  - Land and agriculture resources (Soil quality & fertility, agriculture production & yield, crop damage, etc.)
  - Fishery resources (open water fishing, brackish water fish culture, shrimp production & yield, virus infestation, etc.)
- Socio-economic resources (occupation & employment, migration, quality of life, communication, conflict of interest of shrimp-rice farming, gender aspect, human rights, community conflict, etc.)
- Land ownership, acquisition, and compensation
- Sustainable solution to the above potential problems of the polder in line with the aspects of:
  - Water resources management
  - Land and agriculture recourses management
  - Fishery recourses management
  - Socio-economic resources management
  - Disaster management
- Land acquisition and compensation procedure
- Perception of impacts (both positive and negative) on water, agriculture, fishery, socio-economic and disaster aspects due to implementation of proposed project interventions
- Positive and Negative impacts of the project and mitigation measures.

7.6 Findings of the Public Consultation Meetings

The findings obtained from the consultation meetings are summarized below:

Problems in coastal areas, including polders:

- Cyclones and storm surges are major hazards in the coastal region
- Cyclones, along with storm surges, are creating unfortunate deaths and huge damage to crops and houses due to breaching the embankment
- Crisis of irrigation water during agriculture practices, fish culture (Fresh/sweet water), plant, etc. due to Salinity increase/salinity intrusion
- The agricultural land is losing its normal productivity day by day because of salinity intrusion
- Proper irrigation facilities are required for dry season crop production
- Water supply and sanitation facilities
- Silted up rivers and khals.
- Drainage congestion/water logging is hampering agriculture, fisheries, shrimp/prawn culture
- Overflow of water during the rainy season due to an unprotected area
- Early floods due to storm surges in the coastal region are affecting agriculture, fisheries, shrimp/prawn culture, and salt culture
- Weak WMO activities.

7.7 Information Disclosure (ESS10)

The mechanism of information dissemination should be simple and be accessible to all. Two of the important means followed now include briefing material and the organization of community consultation sessions. The briefing material (all to be prepared in the local language) can be in the form of (a) brochures (including project information, details of entitlements including compensation and assistance to be given to the PAPs; grievance mechanism) that can be kept in the offices of local self-government (Union Parishad office) and project office; (b) posters to be displayed at prominent locations and (c) leaflets that can be distributed in the polder areas. Consultation meetings should also be organized at regular intervals by the project to acquaint the communities, target group beneficiaries, and affected persons with the following:

- Timeline and progress of the project by packages
- Information on beneficiary participation
- Information on involuntary displacement, compensation, and entitlements
- Statement of participation of small ethnic communities
- Timeline for the acquisition of land using voluntary donation, direct purchase, and any other voluntary approach

Also, the opinion and consensus of the community need to be sought for livelihood transformation, relocation of any community assets, and involuntary resettlement management. Information disclosure procedures are mandated to provide citizen-centric information and all documentation necessary for addressing any queries. Disclosure of information will enhance governance and accountability, specifically regarding strengthening monitoring indicators to help the World Bank monitor compliance with the agreements and assess the impact on outcomes.

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9. APPENDIX

Appendix 1 Negative List

Development of polder under CEIP-2 project may be caused the significant negative impacts. A list of negative impacts are described below:

- The project will need to acquire land to construct embankments and water control structures. House, shops common properties vegetation will be affected by the project interventions.
- Agricultural land may be permanently lost in realignment/retreatment of a certain section of the polder.
- Mobilization of construction vehicles for equipment and material transport will deteriorate the noise level at the surrounding sites. The traffic volume will be increased both on the road and river. The polder protected area is populated, and several common infrastructures like schools, madrasa, mosques are inside the polder.
- During the pre-construction stage, there will be a loss of trees due to clearing land for base widening of the polder, realignment of a polder in some areas, and establishment of construction camps.
- The construction of embankments and dredging of canals have important consequences on flood plain ecology. The fish spawning will be impacted if canal excavation happens during the spawning period.
- During contractor mobilization, equipment, machinery, material, and manpower will be transported to the Polder, resulting in additional traffic on roads and waterways. This traffic may potentially cause traffic congestion, particularly on roads and jetties.
- Establishing the contractor's temporary site facilities may involve land clearing, land leveling, excavation, and construction of buildings. These activities may cause air and water contamination, noise generation, safety hazards, a hindrance to local communities, and other similar impacts.
- Embankments can cause drainage congestion in adjacent areas during a period of high rainfall if the high tide exceeds the height of the embankment due to inadequate water outlets. This may cause crop damage and permanent loss of agricultural lands in extreme cases.
- The collection of material is a challenge for the project. Earthwork material is expected to be collected locally. The presence of continuous borrow pits on a riverside induces undercutting of the embankment toes and slopes due to the complete inundation of the riverbank or seashore during the monsoon. The borrow pits and adjoining low-lands, thus inundated, induce a parallel water current to flow near the embankment toes, eroding the surfaces rapidly.
- Dredging will be carried out in the silted drainage channels inside the polder. The spoil material obtained from the dredging activity may create hazards on habitat, sediment, and water quality.
- Public cuts and tubes linking a river or seaside with the countryside of its embankment are frequently observed. These cuts weaken the embankments, exposing them to slow but continual erosive forces. During a flood or cyclonic storm, breaching or major erosion occurs at those points.
- The Project activities, particularly on regulators and sluices and in water channels, may block or clog water drainage channels, potentially causing temporary water logging in the surrounding areas and negatively affecting the cultivation and the associated communities.
- Construction machinery and Project vehicles will release exhaust emissions containing carbon monoxide (CO), sulfur dioxide (SO_2), oxides of nitrogen (NO_X), and particulate matter (PM). These emissions can deteriorate the ambient air quality near the Project sites (particularly along the embankment and around the channel excavation sites and

borrow areas). The establishment of working spaces, earthwork, and storage of construction materials at the project site may cause damage to the soil. The main impacts on the soil during construction are from (i) loss of topsoil from the construction sites; (ii) conversion of the existing land uses such as agriculture and plantations to stockpiles of materials, and damage to the temporarily acquired land; (iii) cut and fill operations, (iv) extraction of fill materials from cut section, and borrow pits, (v) soil erosion slope of the embankment, borrow pits and un-compacted embankments and siltation, and (vi) contamination of the land from hazardous and toxic chemicals and construction material spillage. In addition, site preparation activities generate spoils consisting of crop residue, grasses, trees, and earth.

- The construction activities, particularly demolition of existing structures, excavation, compaction, operation of construction machinery, and vehicular traffic, will generate noise and vibration, likely affecting nearby communities.
- There may be some water pollution from the construction site, labor camps, disposal of dredged material, etc.
- Construction activities on the sluices can potentially affect aquatic habitat and fish migration in the khals.
- Benthic communities play an important role in the food chain for lentic (standing water) and lotic (flowing) water bodies. Construction activities, including re-excavation of *khals*, dredging of rivers, and discharge of solid wastes and waste effluents, can potentially impact the benthic communities of the water bodies.
- Generally, borrow pit sites are the major sources of environmental impact due to dust and noise pollution, loss of biodiversity, and generation of spills. Operation of the quarries above the approved limits may cause the change of floodplain hydrology and trigger erosion and landscape degradation.
- After development, all polders significant adverse cumulative impacts will have occurred.
- After implementing the polder, water habitats such as fish, snakes, and frogs will be destroyed in the polder area.

Appendix 2 Environmental & Social Screening Form

Part-A: Screening Checklist

Project Title: Coastal Embankment Improvement Project II (CEIP II)

Environmental Assessment for Coastal Embankment Improvement Project

Number of the Polder.....Union.....Upazila.....

Name of Enumerator:

.....

Date of Survey:

.....Time.....

Weather Condition: Sunny/Cloudy/ Rainy/Stormy /Foggy/Smog (Tick Mark).

(1) Brief description of Polder Area :

(2) Location of Polder :

(3) Potential benefit from Polder (including estimated number of people benefited):

(4) Ownership of Polder land :
(a) Government/ :
(b) Private land (need acquisition) :

(5) Land Topography (elevation, high land, low land):

(6) Brief information on hydrology (e.g., river network, flow, highest water level, discharge, low water level):

(7) Key activities of Polder:

(8) Estimated cost of Polder Development:

(9) Schedule of implementation:
(a) Embankment Development (months):
(b) Tentative start date and Tentative completion date:

SCREENING QUESTIONS	Yes	No	REMARKS
Project Site Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
• Cultural heritage site	☐	☐	
• Protected area	☐	☐	
• Wetland	☐	☐	
• Mangrove	☐	☐	
• Estuarine	☐	☐	

• Buffer zone of protected area	☐	☐	
• Special area for protecting biodiversity	☐	☐	
Potential Environmental Impacts Will the Project cause …			
• Encroachment on historical / cultural area; disfiguration of landscape by road embankments, cuts, fills, and quarries?	☐	☐	
• Encroachment on precious ecology (e.g. sensitive or protected areas)?	☐	☐	
• Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?	☐	☐	
• Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	☐	☐	
• Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?	☐	☐	
• Any water logging?			
• Loss of existing buildings, property, economic livelihood?			
• Noise and vibration due to blasting and other civil works?	☐	☐	
• Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?	☐	☐	
• Hazardous driving conditions where construction interferes with pre-existing roads?	☐	☐	
• Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?	☐	☐	
• Creation of temporary breeding habitats for mosquito vectors of disease?	☐	☐	
• Dislocation and compulsory resettlement of people living in right-of-way?	☐	☐	
• Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life?	☐	☐	
• Increased noise and air pollution resulting from traffic volume?	☐	☐	
• Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?	☐	☐	

Note:

1) The Project is **Category ……** since many significant issues sited above are involved/not involved with it. However, it suggested that categorisation be reviewed once more filed data is available.
2) As per DoE-MoEF, also IEE/EIA and Environmental Clearance will be required.

Part-B: Detailed Survey Checklist for Baseline Environmental Information

Project Title: Coastal Embankment Improvement Project II (CEIP II)

Number of the Polder……Union……Upazila……

Name of Enumerator:

……

Date of Survey:

……Time……

The enumerator will collect baseline data and information from primary and secondary sources using this detailed checklist to cover the physical, biological, and socioeconomic conditions within the Project area, study area and impact area (5km radius of project area) for representative rural roads, markets and clusters of project areas.

1. Natural Physical Environment

Topography

- Description of the land types [digital elevation model (DEM)]

Land Use

- Description of present land use within the greater Project, Categories should include (%): (*From Primary and secondary data*)

Categories	%
Agricultural	
Urban	
Commercial	
Residential	
Industrial (also informal manufacturing)	
Mixed land use	
Planted Forest	
Village/ settlements (Fringe area of Project sites)	

Climate

- Rainfall pattern for the study area. Maximum, minimum and mean monthly rainfall for the period of record (up to a maximum of about 15 to 20 years)
- General patterns of ambient temperatures and humidity, evapotranspiration and monthly means, maxima and minima for the period of record (up to a maximum of about 15 to 20 years).

Water Resources

Surface Water (Rivers, Catchment Area)

- Natural and artificial drainage systems that affect the project area (i.e. include relevant upstream and downstream systems)
- Erosion/accretion pattern
- Seasonal changes in water levels and drainage
- Effects of existing infrastructure (roads, canals, culverts, structures) on drainage
- Description and map of river / canal erosion hazards

Surface Water Quality (Instrumental survey / secondary sources of selected parameters)

- Major physical, chemical and biological properties of the surface waters of the rivers/ irrigation canals within the project area, and greater Project area that determine how they are used for
- Domestic purposes
- Irrigation
- Livestock
- Wildlife
- Other use (specify)
- Water pollution problems and their sources
- Types of pollutants
- Severity, and effects on water use
- Human activities contributing to water pollution (industrial discharges, urban/ domestic runoff, wastewater, storm water, agricultural drainage, pesticides and fertilisers).

Groundwater

- Quantity and quality of groundwater in local and regional contexts
- Groundwater recharges patterns in the area and their relationship to river discharges and flooding.

Soils

- Description of the basic characteristics of soil series and phases that affect land use, particularly

- Texture (topsoil and subsoil)
- Consistency
- Moisture retention
- Infiltration/permeability
- Chemical composition

- Extent and severity of soil erosion in the area, especially on the following

- Agricultural land
- Embankments
- Other soil / stone-based structures

2. Natural Biological Environment

a) Habitat Type

- Terrestrial Habitats (use the Format below)
- Flora
- Fauna
- Birds

- Freshwater Habitats (use the Format below)
- Flora
- Fauna
- Fish

- Bio-diversity and Conservation

- Sensitive Areas
- Natural Risks and Hazards
- Flood

b) Wildlife

- Description of aquatic habitats.
- Identification, quantification of all major terrestrial wildlife habitat types in the project area (area, seasonality of availability and use)
- Terrestrial wildlife profile based on Species (by reptiles, amphibians, mammals and birds, dominant, residents and migratory species: use Tabular Format)

Reptiles

Local Name	***Scientific Name***	***Occurrence*** *(C- Common; R- Rare; E-Extinct)*	***Remarks***

Amphibians

Local Name	***Scientific Name***	***Occurrence*** *(C- Common; R- Rare; E-Extinct)*	***Remarks***

Mammals

Local Name	***Scientific Name***	***Occurrence*** *(C- Common; R- Rare; E-Extinct)*	***Remarks***

Birds

Local Name	***Scientific Name***	***Occurrence*** *(C- Common; R- Rare; E-Extinct)*	***Remarks***

Human Environment

(This information will be obtained from Social Component of the project)

Population and Demography

- Gender Issues
- Common Resource Rights
  - Fish
  - Fuel wood
  - Grazing
  - Fodder
- Domestic Water Supply
- Sanitation
- Human Health

- Waterborne Disease
- Insect-borne Disease
- Mental Health

- Human Nutrition
- Education and Literacy
- Archaeology and Cultural Sites
- Landscape Aesthetic

a) Economic Environment

(This information will be obtained from Social Component/Field of the project)

- Industry

b) Renewable Energy Resources

- Major sources of biomass fuel in different seasons:
- Fuel wood, leaves and twigs; agricultural wastes, including residues,
- Major uses of such fuel for: cooking; crop processing; manufacturing

c) Homestead Production

- Industry
- Other non-farm Wage Paid Employment

d) Infrastructure and Communications

- Roads and Embankments
- Energy and Power
- Telecommunications

e) Direct Construction Impacts

- Land Acquisition
- Compensation
- Resettlement

f) COVID-19 impact

a) General Environmental Issues

Issues	Actions Required
Waste Disposal and Recycling	
Construction Wastes	
Traffic noise and pollution	
Water Flow	
Spoil or debris	

Chemical and fuel	
Air quality	
Water Quality	
Site Health & Safety	
Welfare on Site	
Traffic Management	
Preservation of archaeological, cultural sites and graveyards	
Environmental enhancement	

b) Local Participation/ Consultation

Different Local Stakeholders

Stakeholder Type	Examples
Local residents (if any)	Women's groups, indigenous groups, those who would directly or indirectly, temporarily lose livelihood, homestead or commercial land within the Project area
Local businesses	Home-based and commercial traders, local business associations
Local peoples' representatives	School head teacher, local NGO members (if any)
Local government officials	Elected representatives
Promoting agency	BWDB
Others	Project location specific (LGED, Fisheries Dept., DOE, DPHE)

Part-C: EIA Checklist

Project Title: Coastal Embankment Improvement Project II (CEIP II)

Environmental Assessment for Coastal Embankment Improvement Project

Number of the Polder……Union……Upazila……

Name of Enumerator:.....

Environmental Parameters Testing

- Air Quality Index (AQI) **(Onsite testing)**
- Noise Data **(Onsite testing)**
- Water Quality Data (**Sample Collection)**
- Soil Sample Collection **(From Site)**

AIR INDEX (ONSITE TESTING)

Date:	**Time:**	
Parameters	**Location**	**Concentration**
Particulate Matter **($PM_{2.5}$)**	Lat: Long:	**$\mu g/m^3$**
Particulate Matter **(PM_{10})**		**$\mu g/m^3$**
Particulate Matter **(PM_1)**		**$\mu g/m^3$**
Humidity (%)		

NOISE INDEX (ONSITE TESTING)

Date:	**Time:**
Lat:	Long:
Parameters	**Concentration**
Noise level, dB (Onsite Measurement)	
Major Noise from Project Site (Plant) (Note)	
Predicted Noise Impact (Note)	

ONSITE WATER QUALITY TEST (SURFACE WATER)

Date:	**Time:**	**Sample ID:**
Lat:	Long:	
Parameters	**Concentration**	
The temperature in Degree Celsius		
Electrical Conductivity in µS/cm		
TDS in ppm		
pH		
Hardness		
Salinity in %		

ONSITE WATER QUALITY TEST (GROUND WATER)

Date:	**Time:**	**Sample ID:**
Lat:	Long:	
Parameters	**Concentration**	
The temperature in Degree Celsius		
Electrical Conductivity in µS/cm		
TDS in ppm		
pH		
Hardness		
Salinity in %		

SOIL SAMPLE COLLECTION

Date:	**Time:**	**Sample ID:**
Lat: Long:		Physical Properties (Colour, odour etc)

Environmental Tests carried out by
Name: _____
Designation: _____
Date: _____
Signature: _____

Checked by
Name: _____
Designation: _____
Date: _____
Signature: _____

Appendix 3 Example ESMP

The Consultant must develop an Environmental and Social Management Plan (ESMP) consisting of feasible and cost-effective mitigation measures and a monitoring and institutional plan to prevent or reduce significant negative impacts to acceptable levels. This will include measures for an emergency response to accidental events (e.g., fires, explosions), as appropriate. The Consultant will estimate the impacts and costs of the mitigation measures and the institutional and training requirements to implement them. In particular, this would include:

Environmental and Social Mitigation & Enhancement Measures: Recommend feasibly and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. Apart from mitigating the potential adverse impacts on the environmental components, the ESMP shall identify opportunities to enhance the environmental quality along the surrounding area. Residual impacts from the environmental measures shall also be identified. The ESMP shall include detailed specifications, bill of quantities, execution drawings, and contracting procedures to execute the suggested environmental mitigation and enhancement measures, separate for pre-construction, construction, and operation periods. In addition, the ESMP shall include good practice guides related to the building and upkeep of plants and machinery. Responsibilities for execution and supervision of each of the mitigation and enhancement measures shall be specified in the ESMP. A plan for continued consultation during the project's implementation stage shall also be appended.

Institutional Arrangements, Capacity Building, and Training: The ESMPs shall describe the implementation arrangement needed for the project, implementation of ESMP, especially the capacity building proposals including the staffing of the environment unit (as and when recommended) adequate to implement the environmental mitigation and enhancement measures. For each staff position recommended to be created, detailed job responsibilities shall be defined. Equipment and resources required for the environment unit shall be specified, and a bill of quantities prepared. A training plan and schedule shall be designed to establish the target groups for individual training programs and the content and mode of training. Training plans shall normally be made for the client-agency (including the environmental unit), the supervision consultants, and the contractors.

Supervision and Monitoring: Environmental monitoring plan will be an integral part of the ESMP, which outlines the specific information to be collected to ensure environmental quality at different stages of project implementation. The parameters and their frequency of monitoring should be provided, along with the cost of the monitoring plan and institutional arrangements for conducting monitoring. Reporting formats should be provided with a clear arrangement for reporting and talk corrective action. The ESMP shall list all mandatory government clearance conditions and the status of procuring clearances.

Reporting: The ESMP will specify the documentation and reporting requirements; specifically, complete records will be maintained for compliance monitoring, effects monitoring, training, grievances, accidents, incidents, resource usage, and waste disposal quantities.

Grievance Redress Mechanism: The ESMP will describe the grievance redress mechanism (GRM) to address the project-related grievances and complaints, particularly from the local communities.

ESMP implementation cost: The ESMP will also include the cost of its implementation, including personnel costs, training costs, effects monitoring, additional studies, and others.

Appendix 4 Sample Participants List and Photographs of Consultation meetings

A total of 41 Stakeholder Consultation meetings were held in the coastal area to get feedback on the proposed project interventions, possible environmental and social impacts, and required mitigation/enhancement measures.

Sample list of Participants are attached

Bangladesh Water Development Board (BWDB)
Coastal Embankment Improvement Project (CEIP-2)

উপকূলীয় বাঁধ উন্নয়ন প্রকল্পের সম্ভাব্য পরিবেশগত ও সামাজিক প্রভাব প্রশমনের উপায় ও ব্যবস্থাপনা নিরুপন বিষয়ক

মত বিনিময় সভা

জেলা: সাতক্ষীরা উপজেলা: শ্যামনগর ইউনিয়ন: পদ্মপুকুর তারিখ: ৫/১২/২১

স্থান: পাখিমারা সরকারী প্রাথমিক বিদ্যালয় পোল্ডার নং: ৭/১ সময়: ৯.৩০

ক্রমিক নং	অংশ গ্রহণকারীর নাম	পদবী ও ঠিকানা	মোবাইল নং	স্বাক্ষর
৭৬	মোঃ মোকছেদুর	ড্রাইভার	01904914285	মো: মোকছেদুর
৭৭	মোঃ হাবিবুল্লাহ	"	01933-623511	হাবিবুল্লাহ
৭৮	মোঃ রিয়াজ আলী	কৃষিকাজ	01942524184	রিয়াজ আলী
৭৯	মোঃ আঃ কাদের	মৎস্য চাষি	01724-848253	কাদের
৮০	মোঃ হেলাল	শ্রমিক	01985-991850	হেলাল
৮১	মোঃ রবিউল	ব্যবসায়	01921-139177	[illegible]
৮২	মোঃ মেহেদী হাসান	ছাত্র	01878262293	মেহেদী
৮৩	মোঃ আঃ আল মামুন	ব্যবসায়	01950909298	মামুন
৮৪	মোঃ বেলাল হোসেন	"	01915936940	[illegible]
৮৫	মোঃ মোতালেব হোসেন	কৃষি কাজ	–	[illegible]
৮৬	মোঃ আবুল আহম্মদ	ব্যবসা	01931-944749	আহম্মদ
৮৭	মোঃ রফিকুল ইসলাম	"	01917938536	রফিকুল
৮৮	মোঃ হাফিজুর রহমান	"	01923867025	হাফিজুর
৮৯	মোঃ রফিকুল ইসলাম	"	01917-938519	রফিকুল
৯০	মোঃ মামুন হোসেন	কৃষিকাজ	01980-674462	মামুন
৯১	শ্রী সুনীল চন্দ্র	"	01922373356	সুনীল
৯২	মোঃ আহেদ	"	–	আহেদ
৯৩	মোঃ রমজান আলী	"	01932990655	[illegible]
৯৪	মোঃ মাহফুজুর রহমান	"	01931289274	মাহফুজুর রহমান
৯৫	মোঃ কামরুল হোসেন	ব্যবসায়	01923399487	কামরুল
৯৬	মোঃ মোজাহিদুল ইসলাম	"	01915763095	মোজাহিদ
৯৭	শ্রী সুভাষ চন্দ্র মন্ডল	কৃষি কাজ	–	সুভাষ মন্ডল
৯৮	শ্রী সন্তোষ চন্দ্র মন্ডল	চিকিৎসক	01939650488	সন্তোষ
৯৯	হাবিবুর রহমান	শ্রমিক	01940269718	হাবিবুর
১০০	মোঃ সফিকুল ইসলাম	"	01991275830	সফিকুল

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মত বিনিময় সভা

Borodol

জেলা: সাতক্ষীরা উপজেলা: আশাশুনি ইউনিয়ন: বড়দল তারিখ: ৬/০২/২২

স্থান: বড়দল ইউপি পোল্ডার নং: ৭/২ সময়: ১৪:০০

ক্রমিক নং	অংশ গ্রহণকারীর নাম	পদবী ও ঠিকানা	মোবাইল নং	স্বাক্ষর
১	Md. Abdul Jalil	U.P. Secretary	01718661102	[signature]
২	[illegible] খাতুন	সংরক্ষিত মহিলা মেম্বার	0172793323	[signature]
৩	Md. Rabiqul Islam	Env. Specialist [illegible]	01743-670140	[signature]
৪	Md. Khabiruddin	Zonal Coordinator	01712144310	[signature]
৫	Md. Kamal Hossain	Coordinator	01759584866	[signature]
৬	[illegible] মন্ডল	ড্রাইভার	01763688078	[signature]
৭	শামীম হোসেন	[illegible]	01729168815	[signature]
৮	মো: সাইফুল ইসলাম	গ্রাম পুলিশ	01735630330	সাইফুল
৯	[illegible]	[illegible]	01731548847	[signature]
১০	[illegible]	[illegible]	[illegible]	[signature]
১১	মোহাম্মদ আলি	চাকুরী	01908-	মোহাম্মদ আলি
১২	শেখ মোশারফ হোসেন	গ্রাম পুলিশ	01709808800	শেখ মোশারফ
১৩	[illegible]	[illegible]	01724713097	[signature]
১৪	আশুতোষ	কৃষি	01795563802	আশুতোষ
১৫	কালিপদ সর্দার	কৃষি	01795563802	কালিপদ
১৬	মো: [illegible]	গ্রাম পুলিশ	01798075725	[signature]
১৭	[illegible]	কৃষি	[illegible]	[signature]
১৮	সুব্রত কুমার মন্ডল	ড্রাইভার	01728845382	সুব্রত
১৯	মো: [illegible] আলী	[illegible]	—	[signature]
২০	আ: [illegible]	কৃষি	0199071333 2	[signature]
২১	[illegible]	কৃষি	01789173740	[signature]
২২	[illegible] রানী	কৃষি	01768509635	[signature]
২৩	[illegible]	গৃহিনী	01799848771	[signature]
২৪	[illegible]	গৃহিনী	01312949278	[signature]
২৫	[illegible]	গৃহিনী	01701820023	[signature]

Md. Sabbiruddin
Field Supervisor

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Md. Juyel Rana R.W

Royal HaskoningDHV Enhancing Society Together · iL · nhc northwest hydraulic consultants · SPMC · CEGIS · ddc Development Design Consultants Limited · KMC Ltd. Working for safe living

Bangladesh Water Development Board (BWDB)
Coastal Embankment Improvement Project (CEIP-2)

উপকূলীয় বাঁধ উন্নয়ন প্রকল্পের সম্ভাব্য পরিবেশগত ও সামাজিক প্রভাব প্রশমনের উপায় ও ব্যবস্থাপনা নিরুপন বিষয়ক

মত বিনিময় সভা

জেলা: খুলনা উপজেলা: পাইকগাছা ইউনিয়ন: চাঁদখালী তারিখ: ৭/১২/২০ ইং

স্থান: ২০ তেতুলপুর সরকারী প্রাথমিক বিদ্যা পোল্ডার নং: সময়: ১০:১৫ am

ক্রমিক নং	অংশ গ্রহণকারীর নাম	পদবী ও ঠিকানা	মোবাইল নং	স্বাক্ষর
৫১	জেলেখা বেগম	গৃহিনী		জেলেখা
৫২	আসমা খাতুন	"		আসমা
৫৩	রাশেদা বেগম	"		রাশেদা
৫৪	ফাতিমা বেগম	"	01761337282	ফাতিমা
৫৫	আরিফা বেগম	"		আরিফা
৫৬	শিরিনা বেগম	"		শিরিনা
৫৭	ইয়াসমিন বেগম	"	01724613038	ইয়াসমিন
৫৮	তানজিলা বেগম	"	—	তানজিলা
৫৯	লতা বেগম	"	01782233587	লতা
৬০	আসমা বেগম	"	–	আসমা
৬১	মনিরা বেগম	"	0179556370	মনিরা
৬২	রুমা বেগম	"	01828989 864	রুমা
৬৩	সালমান হাবিব	ছাত্র	01758539321	সালমান
৬৪	[illegible]	মৎস্যজীবি	—	[illegible]
৬৫	আজিজুল আলম	প্রবাসী	01914247008	[illegible]
৬৬	মোঃ হাবিবুর শেখ	শ্রমিক	01705597810	হাবিব
৬৭	মোঃ আশিকুল	ছাত্র	01794071207	আশিকুল
৬৮	মোঃ মাহফুজুল্লাহ	কৃষক	01719393112	মোঃ মাহফুজুল্লাহ
৬৯	মোঃ কামরুজ্জামান ইসলাম	কৃষি ব্যবসা	01783656938	কামরুজ্জামান ইসলাম
৭০	মোঃ হাসানুর রহমান	ব্যবসা	01729666090	[illegible]

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উপকূলীয় বাঁধ উন্নয়ন প্রকল্পের সম্ভাব্য পরিবেশগত ও সামাজিক প্রভাব প্রশমনের উপায় ও ব্যবস্থাপনা নিরুপন বিষয়ক

মত বিনিময় সভা

জেলা: খুলনা উপজেলা: কয়রা ইউনিয়ন: বাগালী তারিখ: ০৮/১২/২০২১ ইং

স্থান: বাগালী ইউনিয়ন পরিষদ পোল্ডার নং: ১৩-১৪/২ সময়: ১১:০০ ঘটিকায়

ক্রমিক নং	অংশ গ্রহণকারীর নাম	পদবী ও ঠিকানা	মোবাইল নং	স্বাক্ষর
১	মোঃ আব্দুস সামাদ গাজী	চেয়ারম্যান, বাগালী	01918-363900	[signature]
২	Advocate Saidur Rahman	KMC-Consultant	01716-572367	[signature]
৩	Md. Rabiqul Islam	Env. Specialist, KMC	01743-670140	[signature]
৪	Md. Ragib Hasan	RA KMC-Surveyor	01758-644905	[signature]
৫	MD. Taybur Rahman	Surveyor- KMC	01855427844	[signature]
৬	Ashique Ahmed	R.W - KMC	01701054701	[signature]
৭	Firoz Mohmd	R.W. KMC	01727-541875	[signature]
৮	আফজাল	ব্যবসায়ী	01828162448	[signature]
৯	মোঃ ইকবাল হোসেন	সচিব, বাগালী UP	01911-223596	[signature]
১০	মোঃ নুরুল ইসলাম	কৃষক	01739369768	[signature]
১১	জি.এম আকবর আলী	কৃষক	01707034240	[signature]
১২	মোঃ আলী গাজী	কৃষক		[signature]
১৩	তাহের আলী	"		[signature]
১৪	আবদুস সালাম	চাকুরী	01911598443	[signature]
১৫	মোসলেম রুহুল	ব্যবসায়ী	01714671379	[signature]
১৬	আজিজুল রহমান	মৎস চাষী	01715879571	[signature]
১৭	আনোয়ার মোল্লা	কৃষক		[signature]
১৮	মোঃ আবু সাইদ	ব্যবসায়ী	01911506171	[signature]
১৯	মোঃ জাহিদুল	কৃষক	01914339452	[signature]
২০	মোঃ কামরুল ইসলাম	ব্যবসায়ী	01757446657	[signature]
২১	মোঃ আতিয়ার রহমান	ইউ.পি সদস্য	01724394723	[signature]
২২	মোঃ আবুল হাসান	সাবেক সম্পাদক	01715747653	[signature]
২৩	শ্রীঃ সুদেব রায়	চাকুরী	01722379443	[signature]
২৪	মোঃ আলাউদ্দিন	ইউ.পি, সদস্য	[illegible]	[signature]
২৫	মোঃ রফিকুল ইসলাম বাবলু	ইউপি সদস্য	[illegible]	[signature]

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Sample Photographs of Consultation Meetings:

Figure_Apx 4-1: Consultation meetings at Pakhimara Primary school-Samnagar-Paddopukur-Satkhira_P 7/1
Figure_Apx 4-2: Consultation meetings at Baradal UP-Assasuni-Satkhira_P 7/2


Figure_Apx 4-3: Consultation meetings at fatepur primary school-Chandkhali UP-Paikgacha-Khulna_P 10-12



Figure_Apx 4-4: Consultation meetings at Bagali UP-Koyra-Khulna_P 13-14/2

Appendix 5 Details of the ECoPs

ECoP 1: Waste Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
General Waste	Soil and water pollution from the improper management of wastes and excess materials from the construction sites.	The Contractor shall • Before construction, develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food waste, etc.) and submit it to DSM for approval. • Organize disposal of all wastes generated during construction in an environmentally acceptable manner. This will include consideration of the nature and location of the disposal site to cause less environmental impact. • Minimize waste materials production by 3R (Reduce, Recycle, and Reuse) approach. • Segregate and reuse or recycle all the wastes, wherever practical. • Prohibit burning of solid waste • Collect and transport non-hazardous wastes to all the approved disposal sites. Vehicles transporting solid waste shall be covered with tarps or nets to prevent spilling waste along the route • Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process. • Provide refuse containers at each worksite. • Request suppliers to minimize packaging where practicable. • Place a high emphasis on good housekeeping practices. • Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities to temporarily store all wastes before transportation and final disposal.
Hazardous Waste	Health hazards and environmental impacts due to improper waste management practices	The Contractor shall • Collect chemical wastes in 200-liter drums (or similar sealed container), appropriately labeled for safe transport to an approved chemical waste depot. • Store, transport, and handle all chemicals, avoiding potential environmental pollution. • Store all hazardous wastes appropriately in bunded areas away from watercourses. • Make available Material Safety Data Sheets (MSDS) for hazardous materials on-site during construction.

		• Collect hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment, or disposal at approved locations. • Construct concrete or another impervious flooring to prevent seepage in case of spills.

ECoP 2: Fuels and Hazardous Substances Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Fuels and hazardous goods	Materials used in construction have the potential to be a source of contamination. Improper storage and handling of fuels, lubricants, chemicals, and hazardous goods/materials on-site and potential spills from these goods may harm the environment or health of construction workers.	The Contractor shall • Prepare spill control procedures and submit the plan for DSM approval. • Train the relevant construction personnel to handle fuels and spill control procedures. • Store dangerous goods in bunded areas on a sealed plastic sheet away from watercourses. • Refueling shall occur only within bunded areas. • Make available MSDS for chemicals and dangerous goods on-site. • Transport waste of dangerous goods, which cannot be recycled, to a designated disposal site approved by DoE. • Provide absorbent and containment material (e.g., absorbent matting) where hazardous materials are used and stored and personnel trained in the correct use. • Provide protective clothing, safety boots, helmets, masks, gloves, goggles to the construction personnel, appropriate to materials in use. • Ensure all containers, drums, and tanks used for storage are in good condition and are labeled with an expiry date. Any container, drum, or tank dented, cracked, or rusted might eventually leak. Check for leakage regularly to identify potential problems before they occur. • Store hazardous materials above flood plain level. • Put containers and drums in temporary storage in clearly marked areas, where they will not be run over by vehicles or heavy machinery. The site shall preferably slope or drain to a safe collection area in a spill. • Put containers and drums in permanent storage areas on an impermeable floor that slopes to a safe collection area in the event of a spill or leak. • When handling and storing fuels and lubricants, take all precautionary measures, avoiding environmental pollution. • Avoid the use of material with greater potential for contamination by substituting them with more environmentally friendly materials. • Return the gas cylinders to the supplier. However, suppose they are not empty prior to their return. In that case, they

		must be labeled with the name of the material they contained, information on the supplier, cylinder serial number, pressure, their last hydrostatic test date, and any additional identification marking that may be considered necessary.

ECoP 3: Water Resources Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Hazardous Material and Waste	Water pollution from storage, handling, and disposal of hazardous materials, general construction waste, and accidental spillage.	The Contractor shall • Follow the management guidelines proposed in EC0Ps 1 and 2. • Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris, and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways, stormwater systems, or underground water tables.
Discharge from Construction sites	During construction, both surface and groundwater quality may deteriorate due to river construction activities, sewerages from construction sites, and work camps. The construction works will modify groundcover and topography, changing the area's surface water drainage patterns, including infiltration and storage of stormwater. These changes in hydrological regime lead to the increased rate of runoff, increase in sediment and contaminant loading, increased flooding, groundwater contamination, and effect habitat of fish and other aquatic biology.	The Contractor shall • Install temporary drainage works (channels and bunds) in areas required for sediment and erosion control and around storage areas for construction materials • Install temporary sediment basins, where appropriate, to capture sediment-laden run-off from the site • Divert runoff from undisturbed areas around the construction site • Stockpile materials away from drainage lines • Prevent all solid and liquid wastes from entering waterways by collecting solid waste, oils, chemicals, bitumen spray waste, and wastewaters from brick, concrete, and asphalt cutting where possible and transport to an approved waste disposal site or recycling depot • Wash out ready-mix concrete agitators and concrete handling equipment at washing facilities off-site or into approved bunded areas on site. Ensure that the tires of construction vehicles are cleaned in the washing bay (constructed at the construction site entrance) to remove the mud from the wheels. This shall be done at every exit of each construction vehicle to ensure the local roads are kept clean.
Soil Erosion and siltation	Soil erosion and dust from the material stockpiles will increase surface water bodies' sediment and contaminant loading.	The Contractor shall • Stabilize the cleared areas not used for construction activities with vegetation or appropriate surface water treatments as soon as a following practicable earthwork to minimize erosion • Ensure that roads used by construction vehicles are swept regularly to remove sediment • Water the material stockpiles access roads and bare soils on an as-required basis to minimize dust. Increase the watering frequency during periods of high risk (e.g. high winds)

Construction activities in water bodies	Construction works in the water bodies will increase sediment and contaminant loading and affect fish and other aquatic biology.	The Contractor shall • Dewater sites by pumping water to a sediment basin before release off-site – do not pump directly off the site • Monitor the water quality in the runoff from the site or areas affected by dredge plumes, and improve work practices as necessary • Protect water bodies from sediment loads by silt screen or bubble curtains, or other barriers • Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris, and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways, stormwater systems, or underground water tables. • Use environment-friendly and nontoxic slurry during construction of piles to discharge into the river. • Reduce infiltration of contaminated drainage through stormwater management design • Do not discharge cement and water curing used for cement concrete directly into watercourses and drainage inlets.
Drinking water	Groundwater at shallow depths is contaminated with arsenic and hence not suitable for drinking purposes.	The Contractor shall • Pumping of groundwater shall be from deep aquifers to supply arsenic-free water. Safe and sustainable discharges are to be ascertained before the selection of pumps. • Tube wells will be installed with due regard for the surface environment, protection of groundwater from surface contaminants, and protection of aquifer cross-contamination • All tube wells, test holes, monitoring wells that are no longer in use or needed shall be properly decommissioned.
	Depletion and pollution of groundwater resources	• Install monitoring wells both upstream and downstream near construction yards and construction camps to monitor water quality and water levels regularly. • Protect groundwater supplies of adjacent lands

ECoP 4: Drainage Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Excavation and earthworks, and construction yards	Lack of proper drainage for rainwater/liquid waste or wastewater due to the construction activities harms the environment in terms of water and soil contamination and mosquito growth.	The Contractor shall • Prepare a program to prevent/avoid standing waters, which DSM will verify in advance and confirm during implementation • Provide alternative drainage for rainwater if the construction works/earth-fillings cut the established drainage line • Establish local drainage line with appropriate silt collector and silt screen for rainwater or wastewater connecting to the existing established drainage lines already there • Build new drainage lines as appropriate and required for wastewater from construction yards connecting to the public nearby recipient water bodies. Ensure wastewater quality conforms to the relevant standards provided by DoE before it is discharged into the recipient water bodies. • Ensure the internal roads/hard surfaces in the construction yards/construction camps that generate has stormwater drainage to accommodate high runoff during a downpour and that there is no stagnant water in the area at the end of the downpour. • Construct wide drains instead of deep drains to avoid sand deposition in the gutters that require frequent cleaning. • Provide appropriate silt collector and silt screen at the inlet and manholes and periodically clean the drainage system to avoid drainage congestion. • Protect natural slopes of drainage channels to ensure adequate stormwater drains. • Regularly inspect and maintain all drainage channels to assess and alleviate any drainage congestion problem. • Reduce infiltration of contaminated drainage through stormwater management design.
Ponding of water	Health hazards due to mosquito breeding	The Contractor shall • Do not allow ponding/storage of water, especially near the waste storage areas and construction camps • Discard all the storage containers capable of storing water after use or store them in an inverted position.

ECoP 5: Soil Quality Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Filling of Sites with dredge spoils	Soil contamination will occur from the drainage of dredged spoils	The Contractor shall • Ensure that dredged sand used for landfilling shall be free of pollutants. Before filling, sand quality shall be tested to confirm whether the soil is pollution-free. Sediments shall be properly compacted. The top layer shall be the 0.5 m thick clay on the surface and boundary slopes along with grass. Suitable soils shall construct side Slope of Filled Land of 1:2 with proper compaction as per design. Slope surface shall be covered by top soils/ cladding materials (0.5m thick) and grass turfing with suitable grass. • Leaching from the sediments shall be contained to seep into the subsoil or discharge into settling lagoons before final disposal. • No sediment-laden water in the adjacent lands near the construction sites and wastewater of suspended materials excessive of 200mg/l from dredge spoil storage/use area in the neighboring agricultural lands.
Storage of hazardous and toxic chemicals	Spillage of hazardous and toxic chemicals will contaminate the soils	The Contractor shall • Strictly manage the wastes management plans proposed in ECP1 and storage of materials in ECP2 • Construct appropriate spill contaminant facilities for all fuel storage areas • Establish and maintain a hazardous materials register detailing the location and quantities of dangerous substances, including the storage, use of disposals • Train personnel and implement safe work practices for minimizing the risk of spillage • Identify the cause of contamination, if it is reported, and contain the area of contamination. The impact may be contained by isolating the source or implementing controls around the affected site • Remediate the contaminated land using the most appropriate available method to achieve required commercial/industrial guideline validation results.
Construction material stockpiles	Erosion from construction material stockpiles may contaminate the soils	The Contractor shall • Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales, or bunds.

ECoP 6: Erosion and Sediment Control

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Clearing of construction sites	Cleared areas and slopes are susceptible to erosion of topsoils that affects the growth of vegetation which causes ecological imbalance	The Contractor shall • Reinstate and protect cleared areas as soon as possible. • Mulch to protect batter slopes before planting • Cover the unused area of disturbed or exposed surfaces immediately with mulch/grass turfing/tree plantations.
Construction activities and material stockpiles	The impact of soil erosion are (i) Increased runoff and sedimentation causing a greater flood hazard to the downstream, (ii) destruction of the aquatic environment in nearby lakes, streams, and reservoirs caused by erosion and deposition of sediment damaging the spawning grounds of fish, and (iii) destruction of vegetation by burying or gullying.	The Contractor shall • Locate stockpiles away from drainage lines • Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales, or bunds • Remove debris from drainage paths and sediment control structures • Cover the loose sediments and water them if required • Divert natural runoff around construction areas before any site disturbance • Install protective measures on-site before construction, for example, sediment traps • Control drainage through a site in protected channels or slope drains • Install 'cut off drains' on large cut/fill batter slopes to control water runoff speed and hence erosion • Observe the performance of drainage structures and erosion controls during rain and modify as required.

ECoP 7: Top Soil Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Land clearing and earth works	Earthworks will impact the fertile topsoils that are enriched with nutrients required for plant growth or agricultural development	The Contractor shall • Strip the topsoil to a depth of 15 cm and store in stockpiles of height not exceeding 2m. • Remove unwanted materials from topsoil like grass, roots of trees, and similar others. • The stockpiles will be done in slopes of 2:1 to reduce surface runoff and enhance percolation through the mass of stored soil. • Locate topsoil stockpiles in areas outside drainage lines and protect them from erosion. • Construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil. • Spread the topsoil to maintain the physicochemical and biological activity of the soil. The stored topsoil will be utilized for covering all disturbed areas and along with the proposed plantation sites • Before the re-spreading of topsoil, the ground surface will be ripped to assist the bunding of the soil layers, water penetration, and revegetation.
Transport	Vehicular movement outside ROW or temporary access roads will affect the soil fertility of the agricultural lands	The Contractor shall • Limit equipment and vehicular movements to within the approved construction zone • Construct temporary access tracks to cross concentrated water flow lines at right angles • Plan construction access to make use, if possible, of the final road alignment • Use vehicle-cleaning devices, for example, ramps or wash down areas.

ECoP 8: Topography and Landscaping

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Land clearing and earth works	Flood plains of the existing Project area will be affected by the construction of various project activities. Construction activities, especially earthworks, will change the topography, disturb the natural rainwater/flood water drainage, and change the local landscape.	The Contractor shall • Ensure the topography of the final surface of all raised lands (construction yards, approach roads, access roads, bridge end facilities, etc.) are conducive to enhancing natural draining of rainwater/flood water; • Keep the final or finished surface of all the raised lands free from any depression that insists on waterlogging • Undertake mitigation measures for erosion control/prevention by grass-turfing and tree plantation, where there is a possibility of rain-cut that will change the shape of topography. • Cover the uncovered open surface immediately with no use of construction activities with grass-cover and tree plantation to prevent soil erosion and bring improved landscaping.

ECoP 9: Sand Extraction

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Sand extraction	Sand extraction can potentially impact the aquatic habitat, water quality, key aquatic species, and food availability.	The Contractor shall • not extract sand from the river bed in long continuous stretches; alternate patches of river bed will be left undisturbed to minimize the potentially negative impacts on the aquatic habitat. • Not collect large quantities of sand from any single location • not excavate deeper than 3 m at any single site. • Not carry out sand extraction near chars that have sensitive Habitats • not carry out sand extraction during the night, particularly near the chars • obtain approval from DSM before starting sand extraction from any location. • Carry out sand extraction from sand bars to the extent possible. • maintain a record of all sand extraction (quantities, location shown on map, timing, any sighting of key species) • provide silt fences, sediment barriers, or other devices around the extraction areas to prevent sediment-rich water migration into the river channels. • Refuel barges and boats with proper care to avoid any spills. • Make spill kits and other absorbent material available at refueling points on the barges. • Properly collect, treat and dispose of the bilge water from barges and boats. • Regularly service all waterborne plants per the manufacturer's guidelines and be inspected daily before operation. DSM will: • survey the area before sand extraction • identify any sensitive receptors/habitats (e.g., turtle nesting area, bird colony) at or near the proposed sand extraction locations. • Determine 'no-go' areas for sand extraction, based upon the above survey, • monitor the activity to ensure that the contractor complies with the conditions described earlier. • Survey the area after sand extraction to identify any leftover impacts.

ECoP 10: Air Quality Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Air quality can be adversely affected by vehicle exhaust emissions and the combustion of fuels.	The Contractor shall • Fit vehicles with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition. • Operate the vehicles in a fuel-efficient manner • Cover haul vehicles carrying dusty materials moving outside the construction site Impose speed limits on all vehicle movement at the worksite to reduce dust emissions • Control the movement of construction traffic • Water construction materials before loading and transport • Service all vehicles regularly to minimize emissions • Limit the idling time of vehicles to not more than 2 minutes.
Construction machinery	Air quality can be adversely affected by emissions from machinery and the combustion of fuels.	The Contractor shall • Fit machinery with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition in accordance with the specifications defined by their manufacturers to maximize combustion efficiency and minimize contaminant emissions. Proof of maintenance register shall be required by the equipment suppliers and contractors/subcontractors • Focus special attention on containing the emissions from generators • Machinery causing excess pollution (e.g., visible smoke) will be banned from construction sites • Service all equipment regularly to minimize emissions • Provide filtering systems, duct collectors or humidification, or other techniques (as applicable) to the concrete batching and mixing plant to control the particle emissions in all its stages, including unloading, collection, aggregate handling, cement dumping, circulation of trucks and machinery inside the installations
Construction activities	Dust generation from construction sites, material stockpiles, and access roads is a nuisance in the environment and can be a health hazard.	The Contractor shall • Water the material stockpiles access roads and bare soils on an as-required basis to minimize the potential for environmental nuisance due to dust. Increase the watering frequency during high-risk periods (e.g., high winds). Stored materials such as gravel and sand shall be

		covered and confined to avoid their being wind-drifted • Minimize the extent and period of exposure of the bare surfaces • Reschedule earthwork activities or vegetation clearing activities were practical, if necessary, to avoid during periods of high wind and if visible dust is blowing off-site • Restore disturbed areas as soon as practicable by vegetation/grass-turfing • Store the cement in silos and minimize the emissions from silos by equipping them with filters. • Establish adequate locations for storage, mixing, and loading of construction materials, in a way that dust dispersion is prevented because of such operations • Crushing of rocky and aggregate materials shall be wet-crushed or performed with particle emission control systems.

ECoP 11: Noise and Vibration Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Noise quality will be deteriorated due to vehicular traffic	The Contractor shall • Maintain all vehicles to keep it in good working order following manufacturer maintenance procedures • Ensure all drivers comply with the traffic codes concerning maximum speed limit, driving hours, etc. • Organize the loading and unloading of trucks and handling operations to minimize construction noise on the worksite
Construction machinery	Noise and vibration may have an impact on people, property, fauna, livestock, and the natural environment.	The Contractor shall • Appropriately site all noise-generating activities to avoid noise pollution to residents • Use the quietest available plant and equipment • Modify equipment to reduce noise (for example, noise control kits, lining of truck trays or pipelines) • Maintain all equipment to keep it in good working order following manufacturers' maintenance procedures. Equipment suppliers and contractors shall present proof of maintenance register of their equipment. • Install acoustic enclosures around generators to reduce noise levels. • Fit high-efficiency mufflers to appropriate construction equipment • Avoid the unnecessary use of alarms, horns, and sirens.
Construction activities	Noise and vibration may impact people, property, fauna, livestock, and the natural environment.	The Contractor shall • Notify adjacent landholders before any typical noise events outside of daylight hours • Educate the operators of construction equipment on potential noise problems and the techniques to minimize noise emissions • Employ best available work practices on-site to minimize occupational noise levels • Install temporary noise control barriers where appropriate • Notify affected people if major noisy activities will be undertaken, e.g., pile driving • Plan activities on-site and deliveries to and from site to minimize the impact • Monitor and analyze noise and vibration results and adjust construction practices as required. • Avoid undertaking the noisiest activities, where possible, when working at night near the residential areas.

ECoP 12: Protection of Flora

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Vegetation clearance	Local flora is important to provide shelters for the birds, offer fruits and timber/firewood, protect soil erosion, and keep the environment very friendly to human living. As such, damage to flora has a wide range of adverse environmental impacts.	The Contractor shall • Reduce disturbance to surrounding vegetation • Use appropriate type and minimum size of machine to avoid disturbance to adjacent vegetation. • Get approval from the supervision consultant for the clearance of vegetation. • Make selective and careful pruning of trees where possible to reduce the need for tree removal. • Control noxious weeds by disposing them at the designated dump site or burning them on site. • Clear only the vegetation that needs to be cleared in accordance with the plans. These measures are applicable to both the construction areas as well as to any associated activities such as sites for stockpiles, disposal of fill and construction of diversion roads, etc. • Do not burn off cleared vegetation – where feasible, chip or mulch and reuse it for the rehabilitation of affected areas, temporary access tracks or landscaping. Mulch provides a seed source, can limit embankment erosion, retains soil moisture and nutrients, and encourages regrowth and protection from weeds. • Return topsoil and mulched vegetation (in areas of native vegetation) to approximately the same area of the roadside it came from. • Avoid work within the drip-line of trees to prevent damage to the tree roots and compacting the soil. • Minimize the length of time the ground is exposed or excavation left open by clearing and re-vegetate the area at the earliest practically possible. • Ensure excavation works occur progressively and revegetation done at the earliest • Provide adequate knowledge to the workers regarding nature protection and the need of avoid felling trees during construction • Supply appropriate fuel in the work caps to prevent fuel wood collection

ECoP 13: Protection of Fauna

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities	The location of construction activities can result in the loss of wild life habitat and habitat quality.	The Contractor shall • Limit the construction works within the designated sites allocated to the contractors • Check the site for animals trapped in, or in danger from site works and use a qualified person to relocate the animal.
	Impact on migratory birds, its habitat and its active nests	The Contractor shall • Not be permitted to destruct active nests or eggs of migratory birds • Minimize the tree removal during the bird breeding season. If works must be continued during the bird breeding season, a nest survey will be conducted by a qualified biologist prior to commence of works to identify and located active nests • Minimize the release of oil, oil wastes or any other substances harmful to migratory birds to any waters or any areas frequented by migratory birds.
Vegetation clearance	Clearance of vegetation may impact shelter, feeding and/or breeding and/or physical destruction and severing of habitat areas	The Contractor shall • Restrict the tree removal to the minimum required. • Retain tree hollows on site, or relocate hollows, where appropriate • Leave dead trees where possible as habitat for fauna • Fell the hollow bearing trees in a manner which reduces the potential for fauna mortality. Felled trees will be inspected after felling for fauna and if identified and readily accessible will be removed and relocated or rendered assistance if injured. After felling, hollow bearing trees will remain unmoved overnight to allow animals to move of their own volition.
Construction camps	Illegal poaching	The Contractor shall • Provide adequate knowledge to the workers regarding protection of flora and fauna, and relevant government regulations and punishments for illegal poaching.

ECoP 14: Protection of Fisheries

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities in River and Floodplain Water	The main potential impacts to fisheries are hydrocarbon spills and leaks from riverine transport and disposal of wastes into the river and floodplain water	The Contractor shall • Ensure the riverine transports, vessels and ships are well maintained and do not have oil leakage to contaminate river water. • Contain oil immediately on river in case of accidental spillage from vessels and ships and in this regard, make an emergency oil spill containment plan to be supported with enough equipment, materials and human resources • Do not dump wastes, be it hazardous or non-hazardous into the nearby water bodies or in the river.
	The main potential impacts to aquatic flora and fauna River are increased suspended solids from earthworks erosion, sanitary discharge from work camps, and hydrocarbon spills	The Contractor shall • follow mitigation measures proposed in ECoP 3: Water Resources Management and ECoP 4: Drainage Management
Construction activities on the land	Filling of ponds for site preparation will impact the fishes	The Contractor shall • Inspect any area of a water body containing fish that is temporarily isolated for the presence of fish, and all fish shall be captured and released unharmed in adjacent fish habitat • Install and maintain fish screens etc. on any water intake with drawing water from any water body that contain fish.

ECoP 15: Road Transport and Road Traffic Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Increased traffic use of road by construction vehicles will affect the movement of normal road traffics and the safety of the road-users.	The Contractor shall • Prepare and submit a traffic management plan to the DSM for his approval at least 30 days before commencing work on any project component involved in traffic diversion and management. • Include in the traffic management plan to ensure uninterrupted traffic movement during construction: detailed drawings of traffic arrangements showing all detours, temporary road, temporary bridges temporary diversions, necessary barricades, warning signs / lights, and road signs. • Provide signs at strategic locations of the roads complying with the schedules of signs contained in the Bangladesh Traffic Regulations. • Install and maintain a display board at each important road intersection on the roads to be used during construction, which shall clearly show the following information in Bangla: ○ Location: Village name ○ Duration of construction period ○ Period of proposed detour / alternative route ○ Suggested detour route map ○ Name and contact address/telephone number of the concerned personnel ○ Name and contact address / telephone number of the Contractor ○ Inconvenience is sincerely regretted.
	Accidents and spillage of fuels and chemicals	The Contractor shall • Restrict truck deliveries, where practicable, to day time working hours. • Restrict the transport of oversize loads. • Operate road traffics/transport vehicles, if possible, to nonpeak periods to minimize traffic disruptions. • Enforce on-site speed limit

ECoP 17: Construction Camp Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Siting and Location of construction camps	Campsites for construction workers are the important locations that have significant impacts such as health and safety hazards on local resources and infrastructure of nearby communities.	The Contractor shall • Locate the construction camps at areas which are acceptable from environmental, cultural or social point of view. • Consider the location of construction camps away from communities in order to avoid social conflict in using the natural resources such as water or to avoid the possible adverse impacts of the construction camps on the surrounding communities. • Submit to the DSM for approval a detailed layout plan for the development of the construction camp showing the relative locations of all temporary buildings and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use in power supply generators), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps. • Local authorities responsible for health, religious and security shall be duly informed on the set up of camp facilities so as to maintain effective surveillance over public health, social and security matters
Construction Camp Facilities	Lack of proper infrastructure facilities, such as housing, water supply and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards.	The Contractor shall provide the following facilities in the campsites: • Adequate housing for all workers • Safe and reliable water supply. Water supply from deep tube wells of 300 m depth that meets the national standards • Hygienic sanitary facilities and sewerage system. The toilets and domestic waste water will be collected through a common sewerage. Provide separate latrines and bathing places for males and females with total isolation by wall or by location. The minimum number of toilet facilities required is one toilet for every ten persons. • Treatment facilities for sewerage of toilet and domestic wastes • Storm water drainage facilities. Both sides of roads are to be provided with shallow v drains to drain off storm water to a silt retention pond which shall be sized to provide a minimum of 20 minutes retention of storm water flow from the whole site. Channel all discharge from the silt retention pond to natural drainage via a grassed swale at least 20 meters in length with suitable longitudinal gradient.

		• Paved internal roads. Ensure with grass/vegetation coverage to be made of the use of top soil that there is no dust generation from the loose/exposed sandy surface. Pave the internal roads of at least haring-bond bricks to suppress dusts and to work against possible muddy surface during monsoon. • Provide child crèches for women working construction site. The crèche shall have facilities for dormitory, kitchen, indoor and outdoor play area. Schools shall be attached to these crèches so that children are not deprived of education whose mothers are construction workers • Provide in-house community/common entertainment facilities dependence of local entertainment outlets by the construction camps to be discouraged/prohibited to the extent possible.
Disposal of waste	Management of wastes is crucial to minimize impacts on the environment	The Contractor shall • Ensure proper collection and disposal of solid wastes within the construction camps • Insist waste separation by source; organic wastes in one pot and inorganic wastes in another pot at household level. • Store inorganic wastes in a safe place within the household and clear organic wastes on daily basis to waste collector. Establish waste collection, transportation and disposal systems with the manpower and equipment/vehicles needed. • Dispose organic wastes in a designated safe place on daily basis. At the end of the day cover the organic wastes with a thin layer of sand so that flies, mosquitoes, dogs, cats, rats, are not attracted. One may dig a large hole to put organic wastes in it; take care to protect groundwater from contamination by leachate formed due to decomposition of wastes. Cover the bed of the pit with impervious layer of materials (clayey or thin concrete) to protect groundwater from contamination. • Locate the garbage pit/waste disposal site min 500 m away from the residence so that peoples are not disturbed with the odor likely to be produced from anaerobic decomposition of wastes at the waste dumping places. Encompass the waste dumping place by fencing and tree plantation to prevent children to enter and play with. • Do not establish site specific landfill sites. All solid waste will be collected and removed from the work camps and disposed in approval waste disposal sites.
Fuel supplies for	Illegal sourcing of fuel	The Contractor shall

cooking purposes	wood by construction workers will impact the natural flora and fauna	• Provide fuel to the construction camps for their domestic purpose, in order to discourage them to use fuel wood or other biomass. • Made available alternative fuels like natural gas or kerosene on ration to the workforce to prevent them using biomass for cooking. • Conduct awareness campaigns to educate workers on preserving the protecting the biodiversity and wildlife of the project area, and relevant government regulations and punishments on wildlife protection.
Health and Hygiene	There will be a potential for diseases to be transmitted including malaria, exacerbated by inadequate health and safety practices. There will be an increased risk of work crews spreading sexually transmitted infections and HIV/AIDS.	The Contractor shall • Provide adequate health care facilities within construction sites. • Provide first aid facility round the clock. Maintain stock of medicines in the facility and appoint fulltime designated first aider or nurse. • Provide ambulance facility for the laborers during emergency to be transported to nearest hospitals. • Initial health screening of the laborers coming from outside areas • Train all construction workers in basic sanitation and health care issues and safety matters, and on the specific hazards of their work • Provide HIV awareness programming, including STI (sexually transmitted infections) and HIV information, education and communication for all workers on regular basis • Complement educational interventions with easy access to condoms at campsites as well as voluntary counseling and testing • Provide adequate drainage facilities throughout the camps to ensure that disease vectors such as stagnant water bodies and puddles do not form. Regular mosquito repellant sprays during monsoon. • Carryout short training sessions on best hygiene practices to be mandatorily participated by all workers. Place display boards at strategic locations within the camps containing messages on best hygienic practices
Safety	In adequate safety facilities to the construction camps may create security problems and fire hazards	The Contractor shall • Provide appropriate security personnel (police / home guard or private security guards) and enclosures to prevent unauthorized entry in to the camp area. • Maintain register to keep a track on a head count of persons present in the camp at any given time.

		• Encourage use of flameproof material for the construction of labor housing / site office. Also, ensure that these houses/rooms are of sound construction and capable of withstanding wind storms/cyclones. • Provide appropriate type of firefighting equipment suitable for the construction camps • Display emergency contact numbers clearly and prominently at strategic places in camps. • Communicate the roles and responsibilities of laborers in case of emergency in the monthly meetings with contractors
Site Restoration	Restoration of the construction camps to original condition requires demolition of construction camps.	The Contractor shall • Dismantle and remove from the site all facilities established within the construction camp including the perimeter fence and lockable gates at the completion of the construction work. • Dismantle camps in phases and as the work gets decreased and not wait for the entire work to be completed • Give prior notice to the laborers before demolishing their camps/units • Maintain the noise levels within the national standards during demolition activities • Different contractors shall be hired to demolish different structures to promote recycling or reuse of demolished material. • Reuse the demolition debris to a maximum extent. Dispose remaining debris at the designated waste disposal site. • Handover the construction camps with all built facilities as it is if agreement between both parties (contactor and land-owner) has been made so. • Restore the site to its condition prior to commencement of the works or to an agreed condition with the landowner. • Not make false promises to the laborers for future employment in O&M of the project.

ECoP 18: Cultural and Religious Issues

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities near religious and cultural sites	Disturbance from construction works to the cultural and religious sites, and contractors lack of knowledge on cultural issues cause social disturbances.	The Contractor shall • Communicate to the public through community consultation and newspaper announcements regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restriction. • Do not block access to cultural and religious sites, wherever possible • Restrict all construction activities within the foot prints of the construction sites. • Stop construction works that produce noise (particularly during prayer time) shall there be any mosque/religious/educational institutions close to the construction sites and users make objections. • Take special care and use appropriate equipment when working next to a cultural/religious institution. • Stop work immediately and notify the site manager if, during construction, an archaeological or burial site is discovered. It is an offence to recommence work in the vicinity of the site until approval to continue is given by the DSM/PIU. Provide separate prayer facilities to the construction workers. • Show appropriate behavior with all construction workers especially women and elderly people • Allow the workers to participate in praying during construction time • Resolve cultural issues in consultation with local leaders and supervision consultants • Establish a mechanism that allows local people to raise grievances arising from the construction process. • Inform the local authorities responsible for health, religious and security duly informed before commencement of civil works so as to maintain effective surveillance over public health, social and security matters

ECoP 19: Worker Health and Safety

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Best practices	Construction works may pose health and safety risks to the construction workers and site visitors leading to severe injuries and deaths. The population in the proximity of the construction site and the construction workers will be exposed to a number of (i) biophysical health risk factors, (e.g., noise, dust, chemicals, construction material, solid waste, waste water, vector transmitted diseases etc.), (ii) risk factors resulting from human behavior (e.g., STD, HIV etc.) and (iii) road accidents from construction traffic.	The Contractor shall • Implement suitable safety standards for all workers and site visitors which shall not be less than those laid down on the international standards (e.g., International Labor Office guideline on 'Safety and Health in Construction; World Bank Group's 'Environmental Health and Safety Guidelines') and contractor's own national standards or statutory regulations, in addition to complying with the national standards of the Government of Bangladesh (e.g., `The Bangladesh Labor Code, 2006') • Provide the workers with a safe and healthy work environment, taking into account inherent risks in its particular construction activity and specific classes of hazards in the work areas, • Provide personal protection equipment (PPE) for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields, and ear protection. Maintain the PPE properly by cleaning dirty ones and replacing them with the damaged ones. • Safety procedures include provision of information, training and protective clothing to workers involved in hazardous operations and proper performance of their job • Appoint an environment, health and safety manager to look after the health and safety of the workers • Inform the local authorities responsible for health, religious and security duly informed before commencement of civil works and establishment of construction camps so as to maintain effective surveillance over public health, social and security matters.
	Child and pregnant labor	The Contractor shall • not hire children of less than 14 years of age and pregnant women or women who delivered a child within 8 preceding weeks, in accordance with the Bangladesh Labor Code, 2006
Accidents	Lack of first aid facilities and health care facilities in the immediate vicinity will aggravate the health conditions of the victims	• Provide health care facilities and first aid facilities are readily available. Appropriately equipped first-aid stations shall be easily accessible throughout the place of work • Document and report occupational accidents, diseases, and incidents. • Prevent accidents, injury, and disease arising from, associated with, or occurring in the course of work by minimizing, so far as reasonably practicable, the causes of

		hazards. In a manner consistent with good international industry practice. • Identify potential hazards to workers, particularly those that may be life-threatening and provide necessary preventive and protective measures. • Provide awareness to the construction drivers to strictly follow the driving rules • Provide adequate lighting in the construction area and along the roads
Construction Camps	Lack of proper infrastructure facilities, such as housing, water supply and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards.	• The Contractor shall provide the following facilities in the campsites to improve health and hygienic conditions as mentioned in ECoP 17 Construction Camp Management • Adequate ventilation facilities • Safe and reliable water supply. Water supply from deep tube wells that meets the national standards • Hygienic sanitary facilities and sewerage system. The toilets and domestic waste water will be collected through a common sewerage. • Treatment facilities for sewerage of toilet and domestic wastes • Storm water drainage facilities. • Recreational and social facilities • Safe storage facilities for petroleum and other chemicals in accordance with ECoP 2 • Solid waste collection and disposal system in accordance with ECP1. • Arrangement for trainings • Paved internal roads. • Security fence at least 2 m height. • Sick bay and first aid facilities
Water and sanitation facilities at the construction sites	Lack of Water sanitation facilities at construction sites cause inconvenience to the construction workers and affect their personal hygiene.	• The contractor shall provide portable toilets at the construction sites, if about 25 people are working the whole day for a month. Location of portable facilities shall be at least 6 m away from storm drain system and surface waters. These portable toilets shall be cleaned once a day and all the sewerage shall be pumped from the collection tank once a day and shall be brought to the common septic tank for further treatment. • Contractor shall provide bottled drinking water facilities to the construction workers at all the construction sites.
Other ECoPs	Potential risks on health and hygiene of construction workers and general public	The Contractor shall follow the following ECPs to reduce health risks to the construction workers and nearby community • ECoP 2: Fuels and Hazardous Goods Management • ECoP 4: Drainage Management • ECoP 10: Air Quality Management • ECoP 11: Noise and Vibration Management • ECoP 15: Road Transport and Road Traffic Management
Trainings	Lack of awareness and	The Contractor shall • Train all construction workers in basic sanitation and health care issues (e.g., how

	basic knowledge in health care among the construction workforce, make them susceptible to potential diseases.	to avoid malaria and transmission of sexually transmitted infections (STI) HIV/AIDS. • Train all construction workers in general health and safety matters, and on the specific hazards of their work Training shall consist of basic hazard awareness, site specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. • Commence the malaria, HIV/AIDS and STI education campaign before the start of the construction phase and complement it with by a strong condom marketing, increased access to condoms in the area as well as to voluntary counseling and testing. • Implement malaria, HIV/AIDS and STI education campaign targeting all workers hired, international and national, female and male, skilled, semi- and unskilled occupations, at the time of recruitment and thereafter pursued throughout the construction phase on ongoing and regular basis. This shall be complemented by easy access to condoms at the workplace as well as to voluntary counseling and testing.